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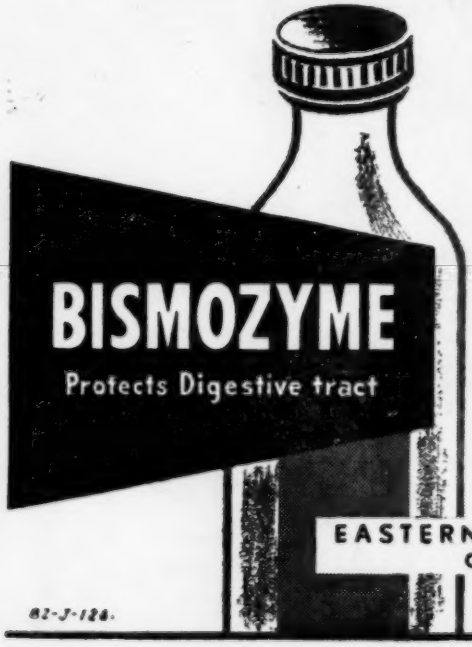

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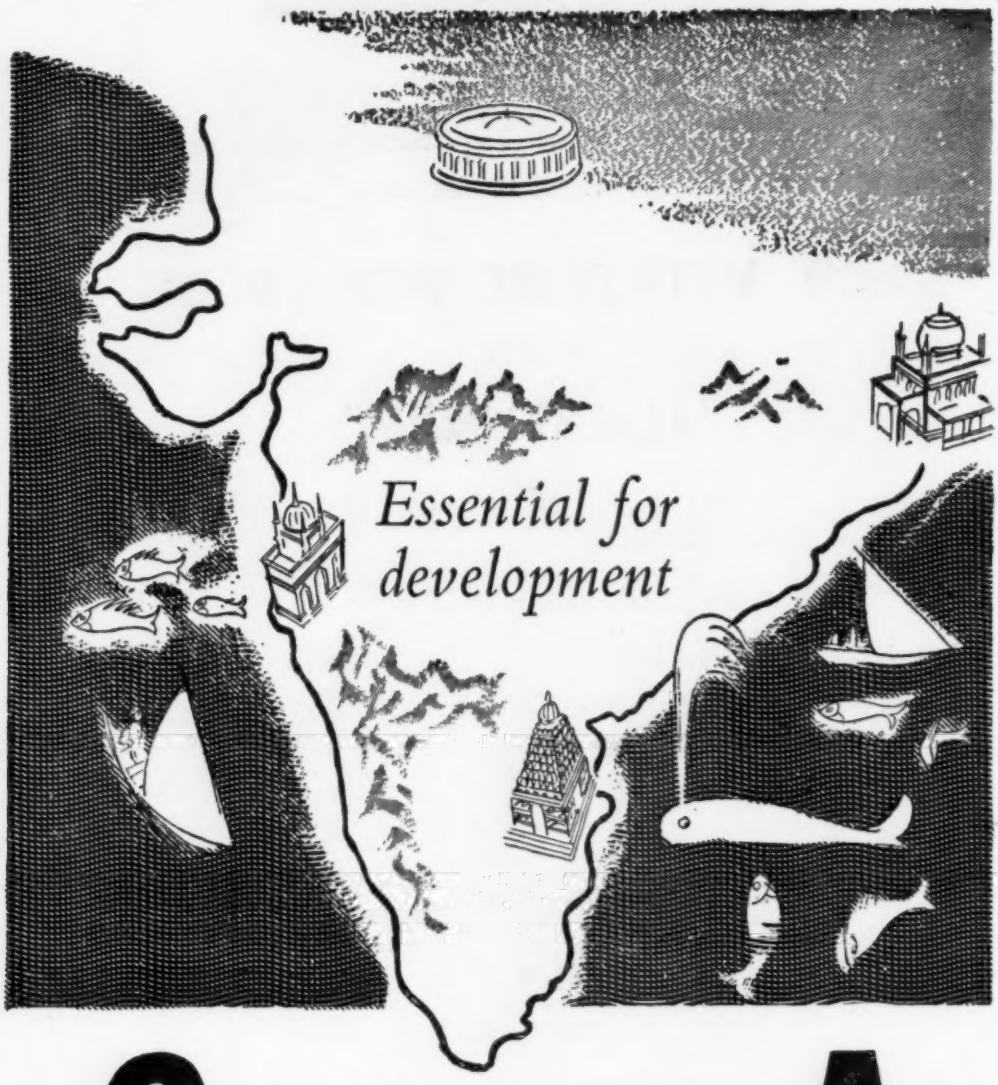

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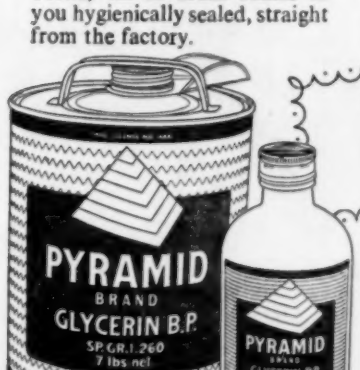

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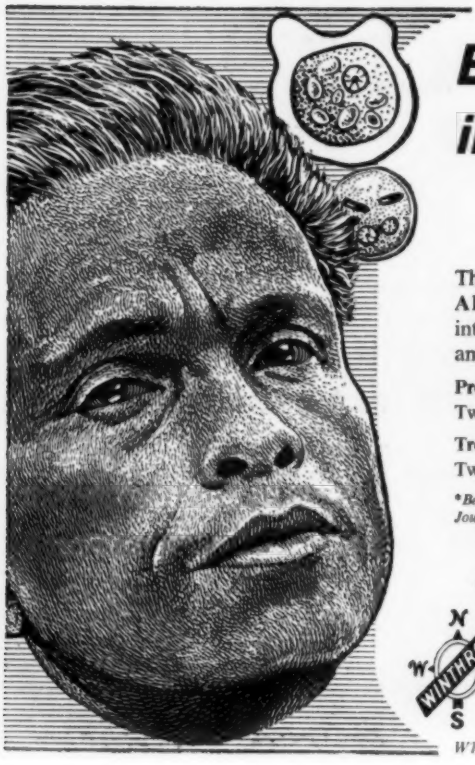

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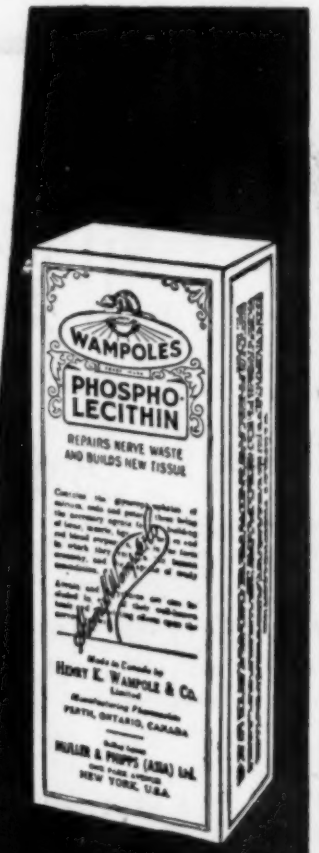

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ORIGINAL ARTICLES

THE INDIAN NEWBORN †

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Towards the end of the last century and beginning of the present, an important advance in obstetrics was made by the use of the foetal head in the measure of foetopelvic proportion. This new idea revolutionised the treatment of contracted pelvis. The foetal head has been used as an yard-stick of measure and Barbour's famous aphorism "Foetal head is the best pelvimeter" came into being. This is useful not only in clinical assessment of foetopelvic proportion but also in its radiological assessment. Nicholson (1939) stated that the area of the presenting part must not exceed 75 per cent to 80 per cent of the brim area and the areas at different levels of the pelvis below it. Moulding of the head causes certain changes in dimensions which are unpredictable and these changes disappear soon after birth and by the fourth day, the infant's head assumes the size and shape of the foetus *in utero* just before confinement (Moir, 1948).

Birthweight as well as weight of the foetus *in utero* are important in many respects. It has been found that the capacity to survive in a premature infant depends on the weight at birth. Similarly, birthweight has been found to influence subsequent development of the infant. Knowledge of the foetal weight *in utero* is clinically important in prevention of prematurity which is a major factor of neonatal death, in estimation of the time when interruption of pregnancy is considered on occasions like conservative management of placenta praevia, treatment of toxaemia of pregnancy and diabetes, repeat caesarean section, and in a borderline pelvis, where premature termination of pregnancy is practised. In all these conditions it will be unwise to induce labour to get an underweight baby.

Birthweight is also important from another standpoint. It is an index of social and economic status of the mother. Hence, it is an important characteristic valuable from the statistical and genetical point of view. Penrose (1954) has stated that this factor depends mainly on environmental influences (70 per cent) and partly (30 per cent) on genetical or hereditary influences. Birthweight greatly depends on the nutritional status of the mother (Baird, 1945a, 1945b and 1953 ; Anselmino, 1954 ; Halbrecht,1954).

The works of Ince (1939) proved that there is high correlation between birthweight and head dimensions like biparietal and occipitofrontal diameters. In my previous work published in 1953, I found a high correlation between the birthweight and biparietal diameter but the work was limited within those two characteristics. The variation of observed values from expected values calculated from regression equation was much in the works of Ince (*loc. cit.*) to be of value in deciding the time for premature induction of labour in a borderline pelvis.

Estimation of the size of the foetal head and weight *in utero* is of great value in obstetrics. It is ridiculous to say that radiological pelvimetry has attained almost perfection when the foetal size remains unknown. Clinical methods of assessment of foetopelvic proportion are useful but have certain limitations. For example, in a transversely

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flattened pelvis as pointed out by Kerr and Moir (1947) and also in a breech presentation leaving aside the oblique and transverse presentations, radiological cephalometry is open to criticism. The reasons are mainly difficulties in technique. But these difficulties are not insurmountable as Donaldson and Cheney (1948) proved in a recent work. At least in all techniques although exact measurement cannot always be made, it is usually possible to state a measurement below which the shortest diameter of the skull must lie.

Estimation of birthweight of the foetus *in utero* is quite a different matter. Although Donaldson and Cheney (*loc. cit.*) proved the accuracy of x-ray foetal cephalometry to be equal to that of pelvimetry, in the same study they have shown that differences in musculatures, skeletal and fatty developments, reduce the accuracy of their birthweight predictions to only 36 per cent within 8 ounces. Of the external methods of measurements, Polous and Langstadt (1953) using their 'volumetric method', based on external transverse and longitudinal measurements of the uterus with the pelvimeter, found that 68 per cent of the birthweights has a deviation of 230 g. in one series and 250 g. in another selected group of 21 vertex presentations. Johnson and Toshach (1954) using Macdonald's measurements of the height of the fundus from the upper edge of the symphysis pubis and following the curvature of the abdomen and using the ischial spines as the fixed points of reference as regards the station of the presenting part, formulated an equation of the order of $Y=A+BX$ with a standard deviation of 12·45 ounces. In both these methods whose efficacy is almost *at par*, the variations of observed weights from expected weights are too great to be of any practical value in cases where this knowledge is essential. This remark applies specially in a borderline pelvis where as MacLennan (1954) has pointed out, slight erroneous variation of weight may unfavourably tip the prognostic balance.

It is well known that the babies in the Western countries are bigger at birth than in India. The present paper aims at estimating the Indian standard, in the present generation.

Material and Method

The present series consists of 355 newborn babies, obtained from an unselected and homogeneous population of the States of West Bengal and Bihar, of a good representative character. Mothers of different socio-economic status calculated on the basis of family income and mode of living, have been classified into 5 groups, Groups I and V representing the highest and the lowest income groups of my series. In Table 1, it will be seen that the so-called middle, i.e., Groups III and IV make 61 per cent of the total and this is the general incidence among the population at large.

Table 1—Percentage Distributions of Different Socio-economic Classes

Socio-economic group	Approximate income per month per family	Number	Percentage
I (upper) ...	Above Rs. 500	34	9·9
II (upper middle)	Rs. 250 to Rs. 500	17	4·4
III (middle) ...	Rs. 150 to Rs. 250	60	16·8
IV (lower middle)	Rs. 50 to Rs. 150	157	44·2
V (labour) ...	Rs. 50	87	24·7
All classes ...		355	100

Note—Average number of heads per family is higher among Groups III, IV and V when compared to Groups I and II. Social obligations are greater and general standard of living higher in Groups III and IV when compared to Group V. Standard of living is still higher in Groups I and II with a comparatively smaller family.

The birthweight and crown-heel length are measured carefully soon after birth. On the fourth day, when all changes due to moulding have disappeared, head dimensions, namely, biparietal and occipitofrontal diameters and circumference of the head are measured. The former two dimensions are measured with the help of engineer's calipers, correct to thousandth of an inch. During measurement undue pressure on the skull is avoided to minimise error in a soft foetal head.

Duration of pregnancy has been calculated from the first day of last normal menstrual period. This fixes a date definitely, if arbitrarily, and has merits for statistical purposes. Unfortunately, due to negligence and lack of education, quite a number of mothers belonging to Group V and some in Group IV could not provide us with the actual date of last period. Moreover, gestation time for single births normally varies widely and Penrose (*loc. cit.*) pointed out that it is close to 280 days with a standard deviation not far from 15 days. It appears, however, that instead of considering duration of pregnancy, in assessment of prematurity, it is better to accept the International Standard of Birthweight of 5½ lb. (2500 g.) or below as the evidence of prematurity. Question of viability among these babies is important and will be discussed later on in the paper.

Prematures and Immatures

Considering from the standpoint of duration of pregnancy wherever it is possible the overall prematurity rate in this series has been found to be 26 per cent. Details are described in Table 2.

Table 2—Prematurity (Percentage) in Different Socio-economic Classes

Group	Upto 32 wk.	32-36 wk.	36-38 wk.	38-40 wk.	Total premature	Total population	Prematurity (per cent)
I	—	—	6	4	10	34	29·0
II	—	1	1	2	4	17	23·5
III	—	4	7	1	12	60	20·0
IV	1	21	14	8	44	157	28·2
V	2	11	6	4	23	87	26·4
Total	3	37	34	19	93	355	26*

Surprisingly, the incidence has been found to be the highest among the highest income group (Group I). This is closely followed by the lower income groups (Groups IV and V) and the lowest incidence is among the middle income group.

When birthweight is considered, incidence of babies weighing 5½ lb. or less, is least among Group I and maximum in Group V. The incidence increases as the socio-economic status of the mother declines. Overall incidence of underweight babies in the series is 37·5 per cent. In Table 3, details of the incidence of underweight babies among different socio-economic groups are described.

Premature termination of pregnancy in the upper income groups (Groups I and II) takes place mostly (92·8 per cent) after 36th week whereas in the lower income group, 45·7 per cent of premature babies are born before the 36th week. Hence, the greater incidence of underweight babies among the lower income group. Difference of 11·5 per cent between premature and underweight babies is mainly due to babies born immature at term, predominantly among the lower income group. But, a portion of this difference must certainly be due to wrong history given by the mother regarding date of last menstruation.

Antenatal supervision appears to lower the incidence of underweight babies by prolonging the duration of pregnancy and also by controlling those factors which lead to underweight babies. In Table 4, the influence of antenatal supervision on duration of pregnancy and prematurity is shown.

Table 3—Distribution of Under-weight Babies among Different Socio-economic Groups

Group	Under 48 oz.	48-56 oz.	57-64 oz.	65-72 oz.	73-80 oz.	81-88 oz.	Total immature	Total population	Immatures (percentage)
I ...	—	—	—	1	—	2	3	34	8·8
II ...	—	—	—	1	—	2	3	17	17·6
III ...	—	—	1	1	3	10	15	60	25·0
IV ...	—	—	2	7	19	34	62	157	39·5
V ...	2	1	7	7	14	19	50	87	57·4
Total ...	2	1	10	17	36	67	133	355	37·5

Table 4—Influence of Antenatal Supervision on Premature Delivery

Group	Without antenatal care				With antenatal care			
			Percentage to total				Percentage to total	
	Before 36 wk.	After 36 wk.	Before 36 wk.	After 36 wk.	Before 36 wk.	After 36 wk.	Before 36 wk.	After 36 wk.
I	—	—	—	—	—	10	—	100
II	—	—	—	—	1	3	25	75
III	3	5	42·9	57·1	1	3	25	75
IV	19	16	54·3	45·7	3	6	33	67
V	11	9	55·0	45·0	2	1	67	33
Total	33	30	52·3	47·7	7	23	23·3	76·7

The difference of percentages of births after 36th week in either group namely, those who received antenatal supervision and those who did not, is 29 per cent, in favour of those who received the supervision. This difference is statistically significant (t=2·929 ; d.f.=52).

Mean age of the mothers who had premature termination of pregnancy is 24·7 years with standard error of ±0·56 years. The incidence is high (31·5 per cent) among the age group of 20 to 23 years and highest (33·3 per cent) after 36th year. The number of cases in the latter age group is small.

Prematurity in primiparas is 28·9 per cent whereas in multiparas it is 24·8 per cent. The difference in percentage is not statistically significant.

General Values of Various Dimensions of the Indian Newborn and Placenta

Mean values of birthweight, crown-heel length, circumference of the head, biparietal and occipitofrontal diameters of the head are calculated with their standard error and tabulated in Table 5.

Table 5—General Dimensions of the Indian Newborn and the Placenta

Dimensions	Mean value	Standard error (±)
Birthweight	93·37 oz.	0·81 oz.
Length of baby ...	18·75 inches	0·071 inch
Circumference of head ...	12·95 ,,	0·115 ,,
Biparietal diameter ...	3·558 ,,	0·043 ,,
Occipitofrontal diameter	4·383 ,,	0·026 ,,
Weight of placenta ...	18·11 oz.	0·243 oz.

After these general remarks on the Indian newborn, it will be worthwhile to see how far environmental factors influence the growth of the baby *in utero*. Of the environmental factors, influence of socio-economic standing of the mother, antenatal supervision and that of age and parity of the mother, have been considered.

Influence of Environmental Factors on Foetal Development

Influence of socio-economic standing and nutritional status of the mother—Better nutritional status and higher socio-economic standing of the mother appear to influence the growth of the foetus *in utero* beneficially. It will be evident in Table 6 that all the dimensions of the newborn are significantly increased with the rise of socio-economic status of the mother. Better nutrition, antenatal supervision and better rest are probably the factors which produce this beneficial result.

Table 6—Mean Values of the Various Dimensions of the Indian Newborn in Different Socio-economic Classes

Dimensions of the newborn	Group V	Group IV	Group III	Groups II & I	All Groups
Mean birthweight (oz.)	88·97 (1·66)	91·44 (1·14)	98·57 (1·74)	104·74 (2·53)	93·37 (0·81)
Length (inches)	18·48 (0·13)	18·67 (0·074)	19·103 (0·116)	19·103 (0·156)	18·75 (0·071)
Circumference of head (inches)	12·757 (0·212)	12·899 (0·237)	13·162 (0·078)	13·252 (0·086)	12·95 (0·115)
Biparietal diameter (inches)	3·489 (0·100)	3·549 (0·050)	3·625 (0·024)	3·655 (0·199)	3·558 (0·043)
Occipitofrontal diameter (inches)	4·318 (0·021)	4·378 (0·050)	4·438 (0·025)	4·470 (0·042)	4·383 (0·026)

Note—Figures in parentheses denote respective standard error.

Groups I and II have been considered together because of smallness of observations in these groups compared to others. Figures in each case represent the statistical mean values and the figures in parenthesis represent their respective standard error. In these figures corrections for prematurity or immaturity have not been made. Hence, slight increase in each dimension may be expected when proper corrections are made. But, on the whole, the table shows how the dimensions of the baby progressively increase with rise of socio-economic status of the mother.

Influence of antenatal supervision—Antenatal supervision has been found to have beneficial effect on the growth of the foetus. In Table 7 this effect on birthweight has been described. In the same table percentages of mothers out of each socio-economic group attending for antenatal supervision have been described. The overall figure is 28 per cent and it will be seen that the percentage of attendance steadily increases with the rise of the socio-economic status of the mother. Antenatal supervision has already been shown to reduce the incidence of underweight babies. In Table 7, the weight of the babies of the mothers who attended antenatal clinic has been compared with the corresponding figures of those not doing so. It will be apparent that antenatal supervision appreciably helps towards the improvement of foetal growth.

TABLE 7—INFLUENCE OF ANTENATAL SUPERVISION ON BIRTHWEIGHT

Socio-economic group	Percentage of attendance for antenatal supervision	Birthweight of newborn attending for antenatal supervision	Birthweight of newborn not attending for antenatal supervision
Groups I & II ...	88	105·6	92·8
Group III ...	49	104·6	94·4
Group IV ...	17	90·7	91·6
Group V ...	7	91·7	88·8
All groups ...	28	100·4	91·0

Thus in Table 7, all groups except Group IV have shown appreciable benefit from this supervision. In the lower middle class (Group IV) the benefit is not appreciable. The reasons may be frequent and closely spaced pregnancies and relatively grosser under-nourishment, compared to Group V and lack of adequate rest during pregnancy and because of their greater social obligations and compulsory maintenance of a standard of living.

Influence of maternal age—The age of the mother has been found to influence the birthweight of the newborn. In Table 8, the average birthweights of the newborn in different age groups of the mother have been described. Birthweight reaches its peak of about 98 oz. (on an average) when the mother's age lies between 26 and 37) and it tends to decrease when the mother's age approaches 40 or falls below 20. This may be due to greater incidence of prematurity.

TABLE 8—INFLUENCE OF MATERNAL AGE ON BIRTHWEIGHT OF NEWBORN

Maternal age (years)	No. of observations	Average birthweight (oz.)
Below 20	64	90·9
20—25	132	91·1
26—31	101	97·6
32—37	37	97·8
38—44	7	90·0
40 and above	2	90·0

Note—In twelve cases maternal age was not recorded.

In Table 9, association between maternal age and birthweight of babies has been described in detail and chi-square test is done. The figures within parentheses represent the expected values in each cell. The observed value of chi-square being 17·88 and the expected value of the same for 12 d.f. and P=0·95 being 5·226, it can be concluded that maternal age and birthweight of babies are highly associated and it may be observed that the birthweight tends to increase with increase in maternal age in general.

TABLE 9—ASSOCIATION BETWEEN MOTHER'S AGE AND BIRTHWEIGHT OF BABIES

Age of the mother	Birthweight of babies in ounces					
	Below 80	80-89	90-99	100-109	110 & above	Total
Below 20	13 (10)	14 (14)	25 (20)	7 (11)	5 (9)	64
20—25	27 (22)	32 (28)	38 (41)	22 (22)	13 (18)	132
26—31	11 (16)	18 (22)	31 (32)	20 (17)	21 (14)	101
32 & above	5 (8)	10 (10)	13 (14)	9 (8)	9 (6)	46
Total	56	74	107	58	48	343

Note—Observed chi-square = 17·88. Expected chi-square = 5·226 (for 12 d.f. P=0·95).
Figures in parentheses represent expected values in each cell.

Influence of parity—Influence of parity on birthweight is negligible as will be evident from Table 10. Co-efficient of correlation of birthweight on parity is only ±0·113 with standard error of ±0·05. This is also statistically negligible.

TABLE 10—INFLUENCE OF PARITY ON MEAN BIRTHWEIGHT

Parity	Mean birthweight (ounces)
1	90·95
2	92·0
3	95·3
4	91·94
5	91·05
6	98·0
7	106·3
8	84·5
9	99·9
10	94·5

Influence of genetical factor—Under this head, I have only considered the influence of sex of the newborn on its birthweight and circumference of the head. In Table 11, means of these dimensions with their respective variances in male and female babies have been described. It will be

TABLE 11—INFLUENCE OF SEX ON BIRTHWEIGHT AND CIRCUMFERENCE OF HEAD

Sex of the newborn	Mean birthweight (ounces)	Variance of birthweight	Mean circumference of head (inches)	Variance of circumference of head
Male	94·34	215·6	13·18	0·255
Female	91·58	225·6	12·98	0·268

Note—Value of "t" with respect to birthweight ... ... 1·71
Value of "t" with respect to circumference of the head ... 2·74 } Observed
Expected value of "t" for d.f. = infinity is ... ... 1·96

noted that there is a difference between the means of the birthweight and the circumference of the head of the male and the female newborn. The mean values of birthweight and the circumference of the head are both higher in a male than in a female baby. But when "t" test is done, the difference in birthweight, in spite of the largeness of sample, is found to be statistically insignificant. When the same test is done with respect to the circumference of the head, the difference of this dimension between the male and female child is found to be statistically significant.

RELATIONS BETWEEN BIRTHWEIGHT AND OTHER DIMENSIONS OF THE NEWBORN

Co-efficient of correlation between birthweight and other dimensions of the newborn which have been considered in this study are found to be positive and high. This means that the birthweight increases with increase in any of these dimensions and *vice versa*. In Table 12, the coefficient of correlation between different characteristics of the newborn with their standard error and significance have been described.

TABLE 12—CORRELATION BETWEEN DIFFERENT CHARACTERISTICS OF THE NEWBORN

Characteristics	Coefficient of correlation	Standard error	Significance
Birthweight Crown-heel distance	+0·57	±0·04	High
Birthweight Circumference of head	+0·67	±0·039	High
Birthweight Occipitofrontal diameter	+0·62	±0·04	High
Birthweight Biparietal diameter	+0·64	±0·03	High

In Tables 13, 14, 15 and 16, relative distributions of birthweight and length of the baby, circumference of the head, occipitofrontal and biparietal diameters of the newborn respectively are mentioned. From these tables positive relationships between these factors will be evident.

TABLE 13—RELATIVE DISTRIBUTIONS OF BIRTHWEIGHT AND LENGTH OF BABY

Birthweight (oz.)	Crown-heel distance (inches) 14·5 to 15·4	15·5 to 16·4	16·5 to 17·4	17·5 to 18·4	18·5 to 19·4	19·5 to 20·4	20·5 to 21·4	21·5 to 22·4	Total
40—49	1	—	—	—	—	—	—	—	1
50—59	—	1	—	—	—	—	—	—	1
60—69	—	3	11	5	1	—	—	—	20
70—79	—	—	10	14	7	—	—	—	31
80—89	—	—	6	37	25	4	1	—	73
90—99	2	1	2	20	57	17	1	1	101
100—109	—	—	—	10	26	16	3	—	55
110—119	1	—	1	2	10	17	3	—	34
120—129	—	—	—	1	5	6	2	—	14
Total	4	5	30	89	131	60	10	1	330

Correlation coefficient = +0·57 Standard error = 0·04
Note—In twenty-five cases data on either crown-heel distance or birthweight are not properly recorded.

TABLE 14—RELATIVE DISTRIBUTION OF BIRTHWEIGHT AND CIRCUMFERENCE OF THE HEAD OF THE NEWBORN

Birthweight (oz.)	Circumference of the head (inches) 11·0 to 11·4	11·5 to 11·9	12·0 to 12·4	12·5 to 12·9	13·0 to 13·4	13·5 to 13·9	14·0 to 14·4	14·5 to 14·9	Total
50—59	—	1	—	—	—	—	—	—	1
60—69	2	3	5	1	—	—	—	—	11
70—79	—	4	7	9	2	—	—	—	22
80—89	—	1	6	18	14	2	—	—	41
90—99	—	—	4	17	27	8	1	1	58
100—109	—	—	—	3	22	5	2	1	33
110—119	—	—	—	4	10	8	3	—	25
120—129	—	—	—	—	3	6	—	—	9
130—139	—	—	—	—	—	—	—	—	0
140—149	—	—	—	—	—	—	1	—	1
Total	2	9	22	52	78	29	7	2	201

Correlation coefficient = +0·67 Standard error = 0·039
Note—In 154 cases data on circumference of the head are not recorded.

TABLE 15—RELATIVE DISTRIBUTIONS OF BIRTHWEIGHT AND OCCIPITOFRONTAL DIAMETER OF THE HEAD OF THE NEWBORN

Birthweight (Midvalues in ounces)	Occipitofrontal diameter of the head (Midvalues in inches)									
	4·052	4·157	4·262	4·367	4·472	4·577	4·682	4·787	4·892	Total
64·5	9	2	—	—	—	—	—	—	—	11
74·5	5	8	6	4	—	—	—	—	—	23
84·5	3	8	9	18	8	5	—	—	—	51
94·5	1	5	10	23	16	11	8	—	—	74
104·5	—	—	4	12	16	10	3	—	1	46
114·5	—	—	—	6	6	8	5	4	—	29
124·5	—	—	—	5	—	3	2	—	—	10
Total	18	23	29	68	46	37	18	4	1	244

Value of "r" = +0·62 Standard error = ±0·04

Note—In 111 cases data on occipitofrontal diameter of the head were not recorded.

TABLE 16—RELATIVE DISTRIBUTIONS OF BIRTHWEIGHT AND BIPARIETAL DIAMETER OF THE HEAD OF THE NEWBORN

Birthweight (Midvalues in ounces)	Biparietal diameter of the head (Midvalues in inches)									
	3·052	3·157	3·262	3·367	3·472	3·577	3·682	3·787	3·892	Total
44·5	—	1	—	—	—	—	—	—	—	1
54·5	—	1	—	—	—	—	—	—	—	1
64·5	2	5	2	6	—	1	—	—	—	16
74·5	1	2	1	14	9	2	3	—	—	32
84·5	—	4	4	9	19	22	12	2	2	74
94·5	—	—	3	10	21	28	22	18	3	105
104·5	—	—	—	2	7	15	16	11	5	56
114·5	—	—	—	—	3	10	11	6	5	35
124·5	—	—	—	—	—	3	2	6	3	14
Total	3	13	10	41	59	81	66	43	18	334

Value of "r" = +0·64 Standard error = ±0·03

Note—In 121 cases data on biparietal diameter were not recorded.

The value of co-efficient of correlation being high we arrive at the following regression equations correlating these characteristics in two's.

1. L = 14·78 + 0·042B S.D. ± 1·04
2. C = 0·026B + 10·6 S.D. ± 0·43
3. B = 49 × "OF" − 120·94 S.D. ± 9·50
4. "OF" = 0·008B + 3·639 S.D. ± 0·14
5. B = 49·8 B.P. − 84·3 S.D. ± 9·50
6. B.P. = 2·82 + 0·008B S.D. ± 0·14

Where, L = Length of baby (inches)
B = Birthweight (ounces)
C = Circumference of the head (inches)
BP = Biparietal diameter of the head (inches)
OF = Occipitofrontal diameter of the head (inches)

As the four characteristics, viz., length (crown-heel distance), circumference of the head, occipito-frontal and biparietal diameters of the head are highly correlated with the same variable birth-weight, it is likely that they are also correlated among themselves—and as such regression equations of the nature of (1), (2), (3) and (4), etc., may be calculated.

Fitness of the Regression Equations

In Tables 17 and 18, values for circumference of the head and length of the baby have been calculated using the corresponding regression equation from a random sample (using Tippett's random sampling number) of birthweight and these have been compared with the actual figures observed. Fitness of the regression equations, from closeness of the observed and calculated values, can be safely declared good. In Table 19, similar figures are calculated using the regression equations correlating birthweight with biparietal and occipitofrontal diameters of the head.

Table 17—Observed and Expected Values of Circumference of the Head from Observed Birthweight of the Newborn

Birthweight (oz.)	Circumference of head (Observed—Inch)	Circumference of head (Expected—Inch)
59	11·5	12·1
70	12·0	12·42
88	12·5	12·9
91	12·7	13·0
92	12·7	13·0
93	13·1	13·0
98	13·1	13·1
104	13·5	13·3
108	14·0	13·4
111	13·5	13·5
113	13·0	13·54
115	12·8	13·6
120	13·5	13·7
128	13·6	13·9
149	14·4	14·47

Table 18.—Observed and Expected Values of Length of the Newborn from Observed Birthweight

Birthweight (oz.)	Length (Observed—Inch)	Length (Expected—Inch)
70	17	17·7
79	17	18·1
94	18	18·7
100	19	19·0
101	18	19·0
104	19	19·2
114	20	19·6
115	20	19·6
123	20	20·0
149	21	21·0

Table 19—Observed and Expected Values of Birthweight, Biparietal and Occipitofrontal Diameters of Babies

Sl. No.	Birthweight (Obs.)	Birthweight (Exp.) from O.F.	Birthweight (Exp.) from B.P.	O.F. (Obs.)	O.F. (Exp.)	B.P. (Obs.)	B.P. (Exp.)
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	65	77	66	4·039	4·159	3·023	3·340
2	66	76	83	4·017	4·167	3·362	3·348
3	69	—	79	—	—	3·274	3·372
4	70	82	85	4·149	4·199	3·396	3·380
5	75	86	89	4·229	4·239	3·483	3·420
6	79	92	90	4·342	4·350	3·496	3·452
7	80	81	94	4·123	4·279	3·373	3·460
8	80	—	73	—	—	3·150	3·460
9	84	83	93	4·159	4·311	3·566	3·492
10	85	—	83	—	—	3·358	3·500
11	86	93	95	4·361	4·327	3·609	3·508
12	88	93	111	4·375	4·343	3·922	3·524
13	90	91	90	4·325	4·359	3·503	3·540
14	91	89	91	4·284	4·367	3·521	3·548
15	92	85	79	4·192	4·375	3·277	3·556
16	94	95	95	4·401	4·391	3·601	3·572
17	98	99	102	4·487	4·423	3·749	3·604
18	101	100	100	4·500	4·447	3·700	3·628
19	102	89	106	4·281	4·455	3·813	3·636
20	105	104	108	4·588	4·479	3·857	3·660
21	106	106	94	4·636	4·487	3·577	3·668
22	108	—	103	—	—	3·758	3·684
23	112	94	100	4·376	4·535	3·698	3·716
24	113	104	107	4·583	4·543	3·845	3·724
25	120	91	93	4·327	4·599	3·560	3·780
26	128	91	109	4·320	4·663	3·888	3·844

Note : Column 1 = Observed birthweight.
" 2 = Birthweight calculated from observed occipitofrontal diameter of the head (O.F.)
" 3 = Birthweight calculated from observed biparietal diameter of the head (B.P.)
" 4 = Observed occipitofrontal diameter of the head
" 5 = Occipitofrontal diameter calculated from observed birthweight.
" 6 = Observed biparietal diameter of head.
" 7 = Biparietal diameter calculated from observed birthweight.

Figs. 1, 2, 3 and 4 graphically present linear representation of the regression equations (1), (2), (4) and (6) respectively with their respective standard deviations and the progression of the mean values of the characteristics represented by the ordinate round this line showing adequate fitness of the regression equations. In each, there are certain ranges where the fitness is maximum and best.

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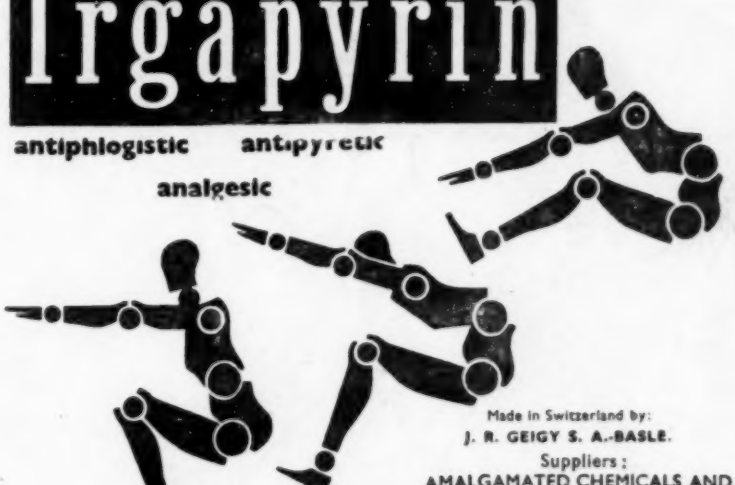

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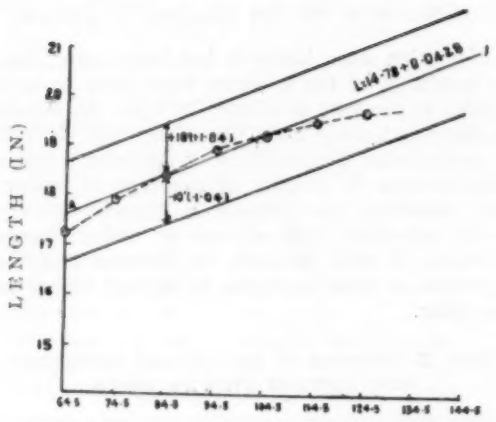
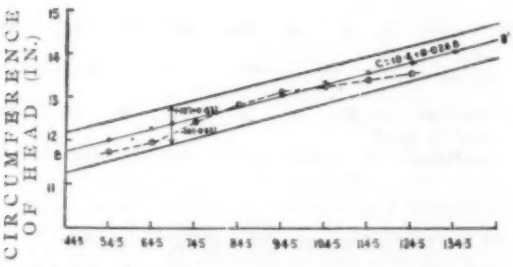


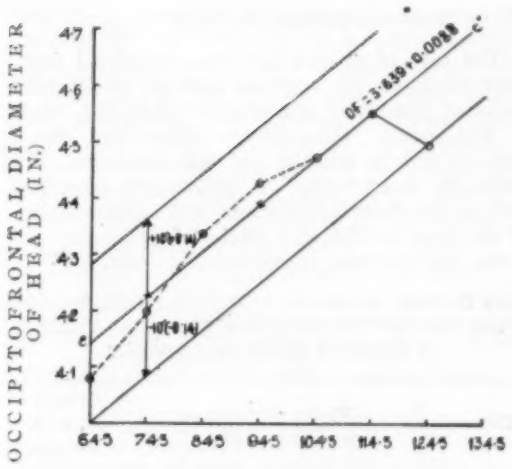
FITEED REGRESSION LINE (AA') BETWEEN BIRTHWEIGHT AND LENGTH OF INDIAN BABIES—LEAST SQUARE METHOD. °—MEAN VALUES OF LENGTHS. SCATTER OF THE OBSERVED VALUES.

FIG. 1—AA' is the linear representation of the regression equation L=14·78+0·042B which has a standard deviation of ±1·04 unit. The area bounded by AA' ±1·04 is expected to include 68 per cent of the observed values. From the actual scatter of the points (not shown in figure for clarity) it is found that most of the observed values lie within this area; but when the mean values of the lengths are considered, it appears that the "fit" is better in the range of birthweights—74·5 to 114·5 (oz.) beyond which the mean values take a downward trend.



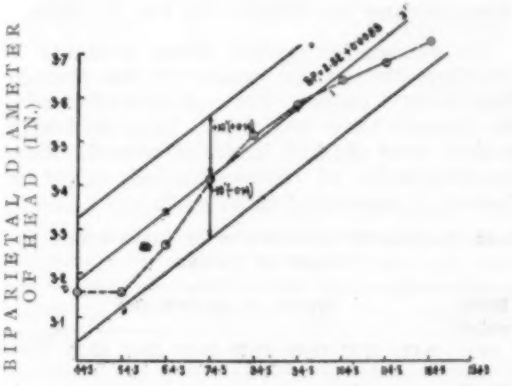
BB'—FITTED REGRESSION LINE TO BIRTHWEIGHT AND CIRCUMFERENCE OF HEAD—LEAST SQUARE METHOD. °—MEAN VALUES OF THE CIRCUMFERENCE OF HEAD.

FIG. 2—BB' is the linear representation of the regression equation C=10·6+0·026B which has a standard deviation of ±0·43. The progression of the mean values of circumference suggests that a quadratic equation of the form of C=a+bB+cB² would have been better. The mean values are closer to the fitted line in the range of birthweight 74·5 to 114·5 (oz.) although 68 per cent of the observed values are expected to lie in the area bounded by BB'±0·43.



CC'—REGRESSION LINE FITTED TO BIRTHWEIGHT AND OCCIPITOFRONTAL DIAMETER OF HEAD—LEAST SQUARE METHOD. °—MEAN VALUES OF OCCIPITOFRONTAL DIAMETER.

FIG. 3—CC' is the linear representation of the regression equation "OF"=3·639+0·008B with S.D. ±0·14. Considering the very small value of standard deviation is can be observed that the "fit" of the regression line is 'very good'. It will be observed that the "fit" is perfect in the region of birthweight between 104·5 and 114·5 (oz.).



DD'—REGRESSION LINE FITTED TO BIRTHWEIGHT AND BIPARIETAL DIAMETER OF HEAD. °—MEAN VALUES OF BIPARIETAL DIAMETER.

FIG. 4—DD' represents the regression line of the equation B.P.=2·82+0·008B with S.D. ±0·14. Progression of the mean values of biparietal diameter suggests that a quadratic form of equation would have been a better "fit" although the fitted straight line has a very small S.D. Better 'fit' is between 74·5 and 94·5 (oz.).

Growth of the Foetus *in utero*

The rate of growth has been calculated from observations on the newborn confined at different weeks of pregnancy commencing from 38th week to 41st week. Observations below and above that are few in number and not considered. In Table 20, mean values of birthweight, biparietal and occipitofrontal diameters and circumference of the head in different weeks of pregnancy are shown and growths calculated therefrom.

Table 20—Rate of Growth of Different Dimensions of the Newborn Calculated from their Mean Values in Different Weeks of Pregnancy

Dimension	Weeks of pregnancy				Growth per week (average)
	38th	39th	40th	41st	
Birthweight (oz.)	83	88	98	108	8·5
Biparietal diameter (inch)	3·408	3·583	3·636	3·657	0·0497 (1·24 mm.)
Occipito-frontal diameter (inch)	4·215	4·382	4·407	4·507	0·064 (1·6 mm.)
Circumference of head (inch)	12·38	13·15	13·19	13·41	0·34 (8·5 mm.)

Birthweight and Weight of the Placenta

The average birthweight, being 93·37 oz., is 5·16 times the average weight of the placenta which is 18·11 ounces. The coefficient of correlation between these two factors being 0·35 with standard error of ±0·05 is also significant. Relative distribution of birthweight and weight of placenta is represented in Table 21.

Table 21—Relative Distribution of Birthweight and Weight of Placenta

Birth-weight (oz.)	Weight of placenta (oz.)							
	8-11	12-15	16-19	20-23	24-27	28-32	33-36	Total
50—59	—	1	—	—	—	—	—	1
60—69	6	9	4	1	—	—	—	20
70—79	4	20	6	1	—	—	—	31
80—89	3	34	23	8	3	—	—	71
90—99	1	28	57	12	3	—	—	101
100—109	—	8	30	15	2	—	—	55
110—119	—	3	16	12	2	—	1	34
120—129	—	—	4	5	3	1	—	13
Total	14	103	140	54	13	1	1	326

Value of "r" = +0·35 Standard error = ±0·05

Note—In 29 cases weight of placenta was not recorded.

The Newborn and Its Relation to Labour

Condition after birth—It has been found that the condition of the newborn after birth bears a relation to the type of labour. In Table 22, details of this relationship have been described. It will be evident that the condition of the baby worsens with increase in severity of the type of labour. The condition that follows a breech delivery closely simulates that of low or outlet forceps delivery. It will, however, be observed that the incidence of white asphyxia is slightly higher in the latter.

Table 22—Condition of the Newborn Immediately after Different Types of Labour

Condition of the newborn after birth	Nature of labour						
	Normal	NE & NT	LF & OF	MF	LUS	Breech	Total
Apnoea	11	—	3	2	4	1	21
Blue asphyxia	11	8	10	6	6	6	47
White asphyxia	—	1	4	1	1	2	9
Good	217	35	8	2	1	5	268
Total	239	44	25	11	12	14	345
Percentage to total asphyxiated	9	20	68	82	92	64	22
Percentage to total in good condition	91	80	32	18	8	36	78

NE & NT = Confinement with episiotomy or tear.

LF & OP = Low and outlet forceps application for delivery.

MF = Midforceps application for delivery.

LUS = Lower uterine caesarian section for delivery.

Note—General anaesthetic was required in LF, OF, MF & LUS and many cases of breech delivery.

Relation of the birthweight and head dimensions to labour—It has been noticed that the percentage of abnormal confinements increases with increase of birthweight and circumference of the foetal head. In Tables 23 and 24, details have been noted.

TABLE 23—RELATION OF THE CIRCUMFERENCE OF HEAD OF THE NEWBORN TO TYPE OF LABOUR

Circumference of head (inch)	No. of total births	No. of normal births	No. of abnormal births	Percentage of abnormal to total births in each head dimension group
Below 13·0	85	75	10	12
13·0—13·5	76	54	22	29
13·5—14·0	30	19	11	37
14·0—14·5	9	4	5	56
Total	200	152	48	24·0

Note—In 155 this relationship has not been studied due to lack of data on circumference of the head.

TABLE 24—RELATION OF BIRTHWEIGHT TO TYPE OF LABOUR

Birthweight (oz.)	No. of total births	No. of normal births	No. of abnormal births	Percentage of abnormal to total birth in each birth-weight group
Below 80	56	45	11	20
80—89	73	56	17	23
90—99	105	80	25	24
100—109	58	40	18	31
110—119	33	21	12	36
120 and above	15	8	7	47
Total	340	250	90	26

In Table 25, the mean values of birthweight and the circumference of the head with their variances with respect to normal and abnormal labours are described. When 't' test is carried out to test the significance of the differences of the mean values of these two factors in relation to type of labour, it is found that in case of the circumference of the foetal head, the value of 't' being 3·89, the difference between the means of the circumference of the head in relation to normal and abnormal confinements is statistically significant. But in case of birthweight the differences in the mean values in same relation are not statistically significant. The value of 't' in this case is only 1·37, whereas, the limit of significance for P—0·95 and infinite degree of freedom, the number of sample being large, is 1·96.

TABLE 25—CIRCUMFERENCE OF THE HEAD AND BIRTHWEIGHT OF THE NEWBORN IN NORMAL *vs.* ABNORMAL LABOUR

Dimension	Mean values in normal labour	Mean values in abnormal labour
Circumference of head (inch)	12·95 (0·35)	13·32 (0·27)
Birthweight (ounces)	92·1 (220)	96·7 (228)

Note—Value of "t" with respect to circumference of the head (df=infinity) is 3·89 whereas it is 1·37 with respect to birthweight differences (df=infinity).
Figures in parenthesis represent respective variances.

DISCUSSION

This paper aims at determination of the present standard of the Indian newborn and the role played by different environmental and genetical factors on this.

Penrose (*loc. cit.*) estimated the approximate partition of causes of variation of birthweight between hereditary and environmental causes as follows:

Maternal hereditary constitution	20 per cent
Foetal hereditary factors: Sex ..	2 per cent
Foetal hereditary factors: remaining constitution ..	16 per cent
Maternal general health and nutrition	16 per cent
Maternal health during each particular pregnancy ..	8 per cent
Maternal parity	7 per cent
Maternal age	1 per cent
Unidentified intra-uterine influences, posture, etc.	30 per cent

From this, inference may be drawn that maternal factors are responsible for a large part of birthweight variations. This also shows that general health and nutrition of the mother during pregnancy and otherwise are also important factors.

One of the potent causes of overall reduction of birthweight is prematurity and immature births. Proper nutrition and health of the mother prevent this. This has been shown in the present paper. Toxaemias of pregnancy and placenta praevia are two other important factors which often lead to premature and underweight babies. Proper antenatal supervision and conservative management of these patients in a hospital go a long way towards controlling the disease and help thereby in increasing the birthweight. This has been adequately substantiated by Hamblin (1952 and 1953) for

toxaemia of pregnancy and Macafee (1945) in case of placenta praevia. In the present study, it has been shown that mothers who attend for antenatal supervision and follow the instructions about food and rest adequately, are likely to have babies with a higher birthweight.

Previous authors have also pointed out the importance of nutrition and antenatal supervision as measures towards prevention of premature and immature births. Vignes (1946), Rapetti (1947), Tompkins (1948) and others have stated that under-nourishment during pregnancy favours abortion, premature labour, and increases the number of babies with less than average weight. Tompkins (*loc. cit.*) further stated that toxaemia of pregnancy is a nutritional deficiency state and he found a higher rate of prematurity and infant mortality in controlled groups suffering a nutritional deficiency due to a greater incidence of toxaemia. Toronto experiments and People's League of Health report (1942), quoted by Bourne and Williams (1945), have also proved that toxaemia is more common among the under-nourished mothers. This higher incidence among the under-nourished is attributed by Holmes (1941) to a reduced intake of protein. Baird (1947, 1948) also has pointed out that the striking fall in still-birth rate in the United Kingdom during the war years affected all age groups and parities except elderly multiparas who mostly did not attend antenatal clinic. This, he ascribes, is largely due to the result of improvement in the quality of expectant mother's diet and increased awareness of the importance of good nutrition during pregnancy. He also pointed out that there is a greater incidence of underweight babies among the controls when compared with booked cases. He further stated that neonatal mortality in the primiparas is nearly 3 times higher in the lower, than in the higher income group. The main reason is greater incidence of prematurity, birth injury, toxaemia and infection. He states that the standard of obstetric care being the same in both groups, this difference in result must be ascribed to the great difference between these two groups, in mother's physique, health and diet, all of which partly or wholly depend on the standard of living. The works of Williams in Rhondda Valley experiment (1938) quoted by Bourne and Williams (1945, 1948) and results of enquiry by Joint Council of Midwifery of the U.K. (1939) also point towards similar conclusion. Improvement of diet and antenatal supervision also improve maternal mortality and morbidity.

Anselmino (1954) stated that temporary conditions of under-nourishment which prevailed in the European countries during and after the second world war, resulted in a more or less significant reduction in birthweight, and a very slight shortening of the body length. He forwarded evidence that under-nourishment of the mother leads to a shortening of the average duration of pregnancy. According to all reports mentioned in his paper, it is the nutritional condition of the mother during the last 3 months of pregnancy which is of decisive importance in regard to the reduction of the weight of the child as during this period the foetus gains over half its weight.

Halbrecht (1954) studied the importance of animal protein in the diet of pregnant mothers. He stated that even when calorific requirements of the body are fully supplied, the reduction of animal protein during pregnancy, causes significant diminution in the birthweight. Burke *et al* (1943b) also arrived at a similar conclusion. Not only is the general growth of the foetus stunted but also they may be born with damaged liver caused by maternal protein deficiency as Woodruff has shown.

The importance of dietary and economic influence has also been stressed by Edwards (1946). He pointed out that during the Bengal Famine in 1942, there was a fall in the average birthweight. From all these works and evidences presented in this paper, it can be concluded that nutrition of the mother both in quantity and quality during pregnancy is important as regards determination of birthweight, as an important factor in causing premature delivery and toxaemia of pregnancy. Douglas (1950) however, in his important paper, remarked that "Social differences were a relatively unimportant factor in premature delivery". A significantly low incidence, however, was found in only the most prosperous 9 per cent of the sample. In the remaining 91 per cent, social class differences were not a factor. He further stated that "Abnormally high rates of premature delivery were found in two well defined working class of women ; primiparas aged 20 or less and multiparas with closely spaced pregnancy. They receive least adequate antenatal supervision and confinement care and they are least likely to receive help in household work". He has, however, stressed on the importance of antenatal supervision and rest during pregnancy and a reasonably well spaced pregnancy in multiparas. Bourne and Williams (1945, 1948) remarked that the nutritional condition of the mother has little influence on her child's weight at birth unless the lack of food during the latter third of pregnancy has approached the degree of starvation. If, however, the calorific intake over the 40 weeks of pregnancy falls to 1,800 or less, there is an increasing fall in the foetal weight after a point where the mother is

living on her own spare tissues and has exhausted them. Toverude has shown that the human birthweight average in Europe is greater of children born in August than of those born in January. This observation describes the effect of the difference of quality of the food (animal protein, minerals and vitamins), and not the quantity which is much the same whatever the season. Among the Indian population which U. N. Survey has declared to be one of the worst fed nations, the total calory intake, is generally and perpetually under the optimum level. At the same time, this food, besides lacking in caloric contents and a proper balance, also lacks in essential animal proteins, minerals and vitamins. Statistical survey also proved that the *per capita* consumption of milk is very poor among Indians. As the nutritional demands of the body increases with pregnancy, a borderline chronic malnutrition may turn into an acute form. Thus, the condition favouring lower birthweight is constantly present among the lower income groups and maternal anaemia is a common feature. In conditions of famine and war, this type of semi-starvation is prevalent which explains the findings of Anselmino (*loc. cit.*) and Halbrecht (*loc. cit.*) already mentioned. The works of Burke *et al* (1943a) also prove the importance of proper diet during pregnancy. These workers have emphasised on the quality of food. Halbrecht (*loc. cit.*) did the same.

In this paper, some relationship, although small, has been detected between birthweight and age of the mother. The birthweight tends to increase with the age of the mother. But contrary to expectation parity of the mother does not appear to have influence on birthweight. The influence of maternal age on birthweight has been stressed upon by the work of Hammond (1944) who has shown that where the mother is young enough to have a competing metabolism serving her own growth, the weight of her foetus will be less than that of a mother similar in other respects but full grown.

The birthweight bears a significant relationship with the weight of the placenta. This is quite reasonable as the placenta is an organ of nutrition of the growing foetus. Knaus (1949) has, therefore, concluded that the uterine environment rather than factors inherent in the foetus regulates foetal growth. Greenhill (1950) agrees with it. Penrose (*loc. cit.*) also has pointed out the importance of intra-uterine influences in determining birthweight. Placental development depends on the space available in the uterine cavity and the size of the foetus on the efficiency with which the placenta can develop in the uterus which is well shaped, easily distensible and rapidly growing.

Sex of the baby exerts its influence, although very small, on birthweight, and head dimensions. Differences as found during this work, in birthweight is not statistically significant but the difference in the mean values of circumference of the head was significant. Similar difference due to sex of the baby has been noted by Penrose (*loc. cit.*), Macdonald (1952, 1953) and others.

Growth of the foetus—Various authors have pointed out that growth of the foetus is maximum during the last three months of pregnancy, during which time the foetus gains over half its weight.

A number of authors in various times tried to measure the rate of growth of head dimensions of obstetric importance during the last few weeks of pregnancy. Scammon and Calkins (1929) stated that biparietal diameter of the head increases by approximately 2·5 mm. per week during the last weeks of pregnancy. From his observations in neonatal period, Moir (*loc. cit.*) stated that this diameter grows at the rate of 2 mm. per week. Joseph (1949) using a new radiological technique, came to a surprising conclusion that no growth took place in the biparietal diameter in the last 4 weeks of pregnancy. This has been proved wrong by later workers. Macdonald (1952, 1953) confirmed that the dimensions of the head increase during the last weeks of pregnancy and the rate of growth of occipitofrontal and biparietal diameters was approximately equal, whereas that of suboccipitobregmatic diameter is slower. He stated that occipitofrontal and biparietal diameters increase by approximately 1 mm. per week, and suboccipitobregmatic by about 0·8 mm. per week, during the period from 35th to 44th week of pregnancy. He stated also that the sex of the foetus while it determines the size of the head, has no influence on its rate of growth. Crichton (1953) stated that the rate of growth of the cranial measurements is not uniform. The average growth of the biparietal diameter will be noted to lie in the neighbourhood of 1 to 1·2 mm., i.e. about half the figure suggested by Moir (*loc. cit.*) and Scammon and Calkins (*loc. cit.*). The rate of growth of occipitofrontal diameter is probably in the region of 1·1 to 1·2 mm. per week and average circumference of foetal head, according to him, usually increases by 3 mm. per week. The figures stated in the present paper are derived from observations in the neonatal period following delivery at 38th to 41st weeks. The rate of growth in the cranial dimensions as observed during this work is almost similar to that of Crichton (*loc. cit.*). Rate of

growth in the circumference of foetal head is not similar.

Relation between birthweight and other dimensions of the newborn—Ince (*loc. cit.*) observed high correlation between birthweight and biparietal and occipitofrontal diameters of the head. Scammon and Calkins (*loc. cit.*) also found a direct relationship between biparietal diameter and crown-rump length. Similar relationship has also been observed in the present work between birthweight and other dimensions of the baby namely, length, biparietal diameter, occipitofrontal diameter and circumference of the head. High coefficient of correlation and closeness of observed and expected figures using the regression equations, prove the fitness of the regression equations.

When analysing the progress of labour in all the cases studied during this work, it appeared that cranial dimensions as well as birthweight play a significant role in prognosis of labour. As these dimensions increase, the incidence of abnormal labour also increases. But again, the role of cranial dimensions in this matter is statistically more significant than that of birthweight.

Conclusion

As maternal factors like health, physique and nutritional status, are so very important in producing children of proper birthweight, the problem is more socio-economic than medical. There must be higher standard of living, adequate supply of food, particularly quality food like animal proteins, minerals and vitamins and also better education of the public, so that they can utilise better the cheaper available protein-containing foodstuffs. There should be better facilities for adequate antenatal supervision, antenatal accommodation in the hospitals and provision for supplementary diet wherever it is necessary. Only by improving the health of the mothers can we expect improvements in birthweight. The average birthweight of children among the most prosperous section of Indian mothers is lower than that of the Western average in general. Hence, there may be some racial or hereditary factors playing their role besides nutritional factor. Penrose suggested that many of the socalled 'Premature' infants are perfectly normal, though small, like adults of short stature. He stated further that large birthweights are also familial. He also proved from familial data on birthweight that there is a marked similarity in brothers and sisters (SIBS) and pointed out that underweight in one child makes underweight more likely for another child born later in the same family. Hence, heredity plays a role in determination of birthweight, although influence of nutrition is very great. From this conclusion it appears that there may be a limit upto which improvement of birthweight in India can be attained. The deterrent factors will be the racial and hereditary characteristics. It is a common experience that many Indian newborn weighing less than 5½ lb. upto about 4 lb. thrive fairly well although they should be considered immature under the terms of the International Conventions. Many of these "Premature" infants would be found vigorous at birth, look well, suck well and progress well. Hence, it may be said that the standard of prematurity for Indian babies should be somewhere between 4 and 5 lb. There is a great deal of truth in the statement of Llewellyn-Jones that "Each country and each race will have to decide upon its own standard of prematurity". Moreover, in the tropical countries the climate, viz., temperature and humidity, is more favourable for the premature when compared with countries of temperate climate.

Birthweight is a guide to subsequent life in childhood. Hence, improvement in birthweight will ensure a better condition of health in infancy and childhood, and lead to better adulthood in future. This is certainly the ideal which should be aspired for.

Summary

(1) A series of 355 newly born Indian babies have been studied and analysed with a view to determining Indian standards regarding birthweight, length (crown-heel distance), and head dimensions, viz., biparietal, occipitofrontal diameters of the head and the circumference, and also to find the influence of nutrition, antenatal supervision, socio-economic status, age and parity of the mother, and sex of baby, on different characteristics of the newborn.

(2) Overall prematurity rate when duration of pregnancy is taken into account has been found to be 26 per cent. When birthweight is considered, the incidence of babies weighing less than 5½ lb. has been found to be 33 per cent. The incidence of the latter increases as the socio-economic status of the mother declines.

(3) Socio-economic status of the mother and antenatal supervision have appreciably beneficial effect on birthweight and dimensions of the newborn.

(4) Within limits birthweight tends to rise as maternal age advances but parity does not exercise any appreciable effect.

(5) Compared to female babies the males have a bigger head and a higher birthweight. Differ-

ence in head dimensions alone is statistically significant.

(6) There is high and positive coefficient of correlation between birthweight and other characteristics of the newborn and regression equations calculated on this basis have been found to have good 'fit' statistically. There are certain ranges of birthweight where 'fitness' is best.

(7) Rate of growth of foetus in birthweight, biparietal and occipitofrontal diameters and circumference of the head from 38th to 41st weeks of pregnancy have been found to be 8·5 ounces, 1·24 mm., 1·6 mm. and 8·5 mm. respectively per week.

(8) Difficulty in labour increases with increase in birthweight and head dimensions. This relationship of labour and head dimensions is statistically significant.

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HAEMATOLOGICAL VALUES OF THE MATURE INDIAN NEWBORN OF NORMAL MOTHERS

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There is no agreed haematological data of the mature newborn babies in the available literature of this country. Dhar (1934) found 18·99 g. per cent to be haemoglobin value of the neonates in Calcutta. Three other workers (Mukherjee, 1940 ; Mukherjee, 1944 ; Banerjee, 1953) recorded 20 g. 18·73 g. and 15·52 g. respectively per 100 ml. of blood on an average. All of them worked with capillary blood from the heel or pulp of the fingers. None of the workers in India seem to have used venous blood for this kind of study. Under these circumstances the investigation of haematological values of mature newborn babies of healthy mothers was worthwhile. The findings on haemoglobin estimation, erythrocyte count, haematocrit value, and reticulocyte count are the subject matter of this communication.

Short Review of Literature

Williamson (1946) drew attention to the fact that the haemoglobin value of a newborn baby was higher than that of an adult. His average figure of haemoglobin in the newborn babies was 23·3 g. per 100 ml. of blood. Merrit and Davidson (1933) and Faxen (1937) corroborated the findings of Williamson.

Mackey (1933) found the average haemoglobin at birth to be 20 g. per 100 ml. of blood. Horan (1950) recorded 20·6 g. per 100 ml. of blood on the 1st day. They used capillary blood for their investigation.

Anderson and Ortmann (1937) determined haemoglobin from venous blood. They found 16·3 g. haemoglobin per 100 ml. of blood on average. Several other workers like Valquist (1941) quoted by Mollison (1951), Chuniard *et al* (1941), Mollison and Cutbush (1949), Gairdner *et al* (1952) also worked with venous blood. The average values of haemoglobin, erythrocytes and haematocrit readings were, however, found to be lower with the venous blood than the values obtained with capillary blood.

Material and Methods

The materials of the study were fifty neonates and their mothers in Chittaranjan Seva Sadan, Calcutta. Babies were selected from healthy mothers who had natural delivery and had their haemoglobin value above 10 g. per cent. Only mature babies were taken for consideration. A weight of five pounds and eight ounces was taken as the limiting criterion of maturity. It may also be mentioned that no asphyxiated baby was included in this study. In case of babies the blood was examined within twenty-four hours but beyond six hours, and again on the 4th day of life.

Collection of blood—Mother's blood was collected from the median cubital vein before the onset of the labour. Blood of the newborn was collected from the femoral vein. In the first week of life skin prick samples of blood are apt to give inaccurate results according to the site, depth of the puncture and temperature of the local part. Oettinger and Mills *et al* (1949) from the simultaneous study of the capillary and venous blood of newborn infants had shown that haemoglobin values of capillary blood was 3·6 g. per cent higher on average, and the range of variation was wider in capillary blood than in the venous one. This difference in the results was thought to be due to the effect of capillary stasis caused by sluggish circulation in the neonatal period. The degree of capillary stasis varies from one baby to another. On the other hand, venous blood yields consistent and reproducible results. This is why Mollison (*loc. cit.*) and Smith (*loc. cit.*) also advocate the use of venous blood even for a single haematological investigation, particularly in case of newborn babies.

Demarsh *et al* (1942) used sagittal sinus as the source of venous blood. It was a dangerous procedure and subsequently abandoned in favour of veins at other sites, such as scalp vein, internal jugular and external jugular vein etc. Even at these sites the question of stasis due to pressure comes in ; but in femoral vein this question of stasis can easily be avoided as it does not require any sort of pressing mechanism.

Technique—3 ml. of blood was collected from the femoral vein using a sharp 19 gauge B. D. needle. The baby was put in supine position. After cleansing the groin with iodine and alcohol, one assistant covered up the external genitalia with the napkins and held the legs. After palpating the pulsation of femoral artery, the skin was pierced below the inguinal ligament just medial to the artery. The needle was then pushed vertically till it touched bone. Then the needle was

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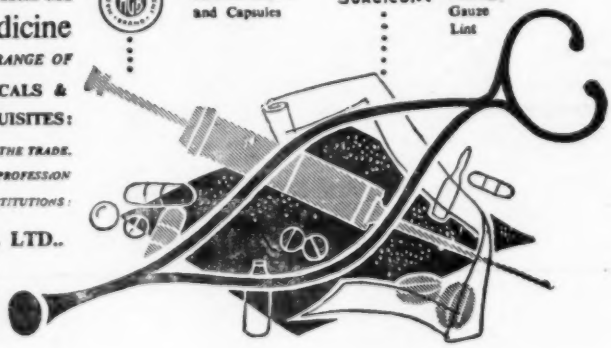

slowly withdrawn. Three ml. of blood readily flowed into the syringe within 15 seconds. As the blood of the newborn baby is highly viscous, at the time of withdrawal, absolute dryness of the syringe was scrupulously maintained to prevent the clumping and clotting. Bleeding was stopped by pressing the area with a dry sterile cotton swab for 2 to 3 minutes. Several prickings at one site were carefully avoided.

Haemoglobin estimation, erythrocyte count and reticulocyte count were done according to techniques described by Napier and Das Gupta (1945). But it needs mentioning that in case of newborn babies the blood was kept in the acid solution for one hour instead of half an hour as in the case of the mothers. Haemoglobin value was standardised against the value of the whole blood iron according to Wong's method (Hoffman, 1941).

Barnes *et al* (1948) found that about 5 per cent of plasma remains trapped in the red cell column even after centrifugalisation of the haematocrit tubes. So the true red cell volume should be calculated by multiplying the red cell column in the tube by the factor 0·95. Mollison *et al* (1950) derived the venous haematocrit value from the observed packed cell volume using the formula Pcv-2 multiplied by 0·95. The unit 2 was arbitrarily chosen to avoid difficulty in reading the top margin of the red cells.

In the present series it was found that the height of the white layer and the mixed layer was not the same in most of the cases, as a result the subtraction of unit 2 from the observed packed cell volume (including white layer) might not represent the uniform reading of red cell column. So where this difficulty was encountered the mid-point of the mixed layer was taken to be the reading of the red cell column. That reading was then multiplied by 0·95 to calculate the corrected haematocrit value. Where the pink upper margin of the red cells could be easily demarcated from the white layer, reading of that point was multiplied by 0·95. As M. C. V. and M. C. H. C. are intimately related with the determination of true red cell volume per cent—five per cent of plasma trapped in the cell column will raise the haematocrit value and thus will vitiate the calculation of the absolute values. Hence it was thought imperative to express haematocrit value as "corrected haematocrit".

Results and Discussion

Haemoglobin on the 1st day—Results are shown in Table 1 and Table 3. Average haemoglobin value of the newborn babies on the first day was 17·18 ± 1·13 g. per 100 ml. of blood with the coefficient of variation of 6 per cent. 95 per cent of the results were within the range of 14·92 g. to 19·44 g. per 100 ml. of blood. The results in Table 3 indicate that average haemoglobin level of the mature baby on the 1st day in the present series agrees with average haemoglobin value calculated from the data of other workers. But their results show wide range of variation (13·1 to 23 g. per cent). This difference may be due to the fact that some of the babies have been examined within one hour to one and a half hour of their birth when the haemopoietic system and the haemodynamics of the babies were unstable. Gairdner *et al* (*loc. cit.*) observed 20 g. haemoglobin per 100 ml. of blood within 24 hours which is higher than the present series. He, however, did not mention about the standard deviation or the range of variation. Mollison and Cutbush (1949) found the average haemoglobin to be 18·6 g. per 100 ml. on the 1st day with the S.D. ± 2 g., i.e., CV was ± 11 per cent. Anderson and Ortman (1937) calculated the coefficient of variation to be more than 12 per cent on their

Table I—Showing Haematological Values of Mature Babies of Normal Mothers (50 Cases)

	First Day			Fourth Day		
	Mean value	S.D.	C.V.	Mean value	S.D.	C.V.
Hb. g. %	17·18	1·13	6·0	16·05	0·92	5·4
R.B.C. (mill.)	5·01	0·33	6·5	4·71	0·34	7·4
C.V. %	54·55	3·3	6·05	49·9	3·52	7·0
M.C.V. (cμ)	107·2	4·05	4·0	105·0	3·75	3·5
M.C.H. (γγ)	33·8	1·33	3·1	33·9	1·5	4·6
M.C.H.C. (%)	31·4	1·31	4·1	31·8	1·49	4·6
Reticulocyte (%) ...	4·9 (2·7-6·8)	...	...	1·2 (0·4-3·0)	...	...

S.D. = Standard deviation C.V. = Coefficient of variation

TABLE 2—SHOWING THE AVERAGE HAEMOGLOBIN, ERYTHROCYTE AND HAEMATOCRIT VALUES OF MATURE BABIES ACCORDING TO BIRTHWEIGHT

Birthweight	The present series (venous blood)				Mackay's series (capillary blood)			
	No. of cases	Hb. g. %	R.B.C./mill	Hct.	Birthweight	No. of cases	Hb. %	* Hb. g. %
8 lb.—8 lb. 15 oz. ...	2	18·67	5·25	56·9	8 lb.	14	139	19·19
7 lb.—7 lb. 15 oz. ...	7	16·35	4·71	51·5	7 lb.	22	141	19·47
6 lb.—6 lb. 15 oz. ...	23	17·3	5·04	54·8	6 lb.	14	148	20·42
5 lb. 8 oz.—5 lb. 15 oz.	18	17·4	5·05	55·0	5 lb.	12	158·5	21·87

* Haemoglobin 100 per cent – 13·8 g. per cent.

TABLE 3—SHOWING HAEMATOLOGICAL VALUES OF NEWBORN BABIES BY DIFFERENT WORKERS (FROM VENOUS BLOOD)

	Gairdner *et al* (1952)	Chuinard *et al* (1941)		Smith (1951)	Mollison and Cutbush (1950)	Oettinger and Mills (1949)	Wegelius (1948)	Anderson and Ortmann (1937)	Dutta Chaudhuri and Chaudhuri (1956)
		Male	Female						
No. of cases									
1st day ...	12	11	9	...	34	24	43	19	50
4th day ...	24	9	10	...	...	...	...	...	50
Hb. g. %									
1st day ...	20·0	17·39	17·01	17·1	18·6 ± 2	16·3 (13·0-20·1)	19·1 (12·7-24·4)	16·3 (12·7-24·4)	17·18 ± 1·13
4th day ...	18·6	16·39	17·45	...	...	...	...	...	16·05 ± 0·92
R.B.C.									
1st day ...	5·81	4·66	4·65	4·86 (3·67-6·1)	...	...	4·58 (3·1-5·6)	5·19 (4·2-6·85)	5·01 ± 0·33
4th day ...	5·67	4·78	4·56	...	...	...	...	...	4·71 ± 0·34
Haematocrit									
1st day ...	63·0*	46·09	45·6	58 (38-70)	56·9*	...		...	54·55 ± 3·3*
4th day ...	57·0*	43·27	44·78	55·0	...	...	...	...	49·9 ± 3·75*
M.C.V. $c\mu$									
1st day ...	108·0	99·0	99·36	110·0	...	...	...	...	107·2 ± 4·02
4th day ...	99·3	90·88	98·02	...	...	...	...	...	105·0 ± 3·5
M.C.H. ($\gamma\gamma$)									
1st day ...	34·5	37·34	35·88	...	...	...	...	...	33·8 ± 1·38
4th day ...	32·9	34·6	38·16	...	...	...	...	...	33·9 ± 1·58
M.C.H.C. %									
1st day ...	32·6	...	...	...	...	...	...	...	31·4 ± 1·31
4th day ...	33·0	...	...	...	...	...	...	...	31·8 ± 1·49

* Corrected haematocrit.

data, but it is only 6 per cent in the present series. Thus the haemoglobin values 17·18 g. ± 1·13 g. on the day of birth of the newborn baby as observed in the present series is significant.

Haemoglobin on the 4th day—The average haemoglobin value of the newborn babies was 16·05 ± 0·92 g. per 100 ml. The coefficient of variation being 5·47 per cent most of the results were within the limit of 14·2 to 17·89 g. per cent. Thus fall in the haemoglobin level on the fourth day was evident and it was significant. This trend of fall was also experienced by Chuinard *et al* (*loc. cit.*) and Gairdner *et al* (*loc. cit.*) who observed 16·92 and 18·6 g. per 100 ml. of blood respectively on the 4th day. The average fall in this series was 1·13 g. per 100 ml. of blood on the 4th day, the maximum being 3 g. and minimum being 0·66 g. per 100 ml. of blood. Gairdner *et al* (*loc. cit*) recorded an average fall to be 1·4 g. per 100 ml. of blood. The fall was 6·6

per cent of the first day's haemoglobin value in the present series and 7·0 per cent in Gairdner's series. Chuinard *et al* (*loc. cit.*) recorded a rise of 0·44 g. haemoglobin per 100 ml. of blood in female babies and fall by 1·0 g. amongst the male babies. This was not the case in the present series. Moreover, in Chuinards' series erythrocyte count and haematocrit values of the male and female babies on the 4th day were not consistent with their haemoglobin values as shown in Table 3. Vahlquist (1941) quoted by Mollison (1951) observed a rise of haemoglobin (18·4 g. per cent to 19·4 g. per cent) on the 6th day. It is rather difficult to explain this rise when all workers (working with venous blood) including the present authors, observed a tendency towards fall on the 4th day.

Erythrocyte count on the 1st day.—The average erythrocyte count was 5·01±0·33 million per c. mm. of blood. The coefficient of variation was 6·5 per cent. 95 per cent of the values lie between 4·34 to 5·67 million per c.mm. of blood. Smith (*loc. cit.*) quoted the average red cell count to be 5·2 million per c. mm. of blood with a range of 3·8 to 6·1 million. Chuinard *et al* (*loc. cit.*) recorded an average 4·66 million erythrocyte count per c. mm. of blood from the study of 10 male and 10 female newborn babies. On the other hand, Gairdner *et al* (*loc. cit.*) observed the average erythrocyte count to be 5·81 million per c. mm. of blood. None of the workers did mention the standard deviation. Berg (1945) suggested that under the normal conditions of careful counting the standard deviation should be 0·39 million red cells and coefficient of variation should be 7·8 per cent in a 5 million red cell count. Hence the erythrocyte count 5·10±0·33 of the present series with C. V. 6·5 per cent may be considered as standard erythrocyte count of normal neonates on their first day of life.

Erythrocyte count on the 4th day—Average red cell count was 4·71±0·34 million per cubic millimeter of blood with coefficient of variation of 7·4 per cent. Most of the results varied between 4·03 to 5·39 million per c. mm. of blood. The average fall was 0·3 million per c. mm. of blood. This fall was found to be statistically significant. Gairdner *et al* (*loc. cit.*) recorded 5·67 million of red cells per c. mm. of blood. The average fall was 0·14 million and the fall was 2·8 per cent while it was 5·6 per cent in the present series. Chuinard *et al* (*loc. cit.*) observed fall among the female babies but rise among the male babies. But the average value of erythrocyte remained same (4·67 million) as on the first day. This discrepancy may be due to the fact that they did not examine the same baby on the first and fourth day of their life in all of their cases (Table 3).

Haematocrit value on the first day (Tables 1 and 3)—The average corrected haematocrit value was 54·55±3·3 per cent with the coefficient of variation 6·05 per cent. Most of the values lie within the range of 48·1 to 61·0 per cent. Gairdner *et al* (*loc. cit.*) and Mollison and Cutbush (1949a) recorded the average corrected haematocrit value to be 63·0 and 56·9 per cent respectively. Their haemoglobin values and erythrocyte counts were also higher than the present series. Smith (1951) quoted from Brown that the average haematocrit value on the first day was 58 per cent with a range of 38·0 to 70·0 per cent which was no doubt a wide range. If this value was to be corrected for trapped plasma multiplying by the factor 0·95, the corrected figure should have been 55·6 per cent which more or less agrees with the present result. He concluded that the reasonable range of haematocrit value should be 46 to 60 per cent, i.e., if corrected 43·7 to 57 per cent. Chuinard *et al* (*loc. cit.*) recorded average haematocrit value to be 45·85 per cent which was even lower than our minimum haematocrit value ; they however used only potassium oxalate powder as anticoagulant which might have caused the shrinkage of the red cells. Regarding the standard deviation or coefficient of variation, all other workers were silent. Wintrobe (1946) found the coefficient of variation of the normal adult haematocrit value to be 7·1 per cent, while it was only 6·05 per cent in the present series. Hence the haematocrit value 54·55±3·3 per cent may be considered as significant value on the first day of life.

Haematocrit value on the fourth day—The average haematocrit value on the fourth day was 49·9±3·52 per cent with the coefficient of variation 7·0 per cent. The average fall was 4·7 per cent. This fall was found to be significant. Gairdner *et al* (*loc. cit.*) and Chuinard *et al* (*loc. cit.*) observed the decline on the fourth day, and the average fall was 6·0 per cent and 1·85 per cent respectively in their series.

Mean corpuscular volume on the first day (Tables 1 and 3)—Mean corpuscular volume of the newborn babies was 107·2±4·05 cubic microns. The coefficient of variation was 4 per cent. The values lie between 99·1 and 115 cubic microns. The value of M.C.V. was observed by Gairdner *et al* (*loc. cit.*) and Smith (1951) to be 108 and 110 cubic microns respectively. Chuinard *et al* (*loc. cit.*) recorded the average M.C.V. to be 99·1 cubic microns. Wintrobe (*loc. cit.*) found the average M.C.V. to be 107 cubic microns from the capillary sample of blood with the variation ± 10 cubic microns. With capillary blood Mukerjee (1940)

(*loc. cit.*) and Horen (*loc. cit.*) recorded the mean corpuscular volume to be 104 and 95·5 cubic microns respectively. But Mukerjee (1944) using capillary blood with the same technique under identical conditions observed M.C.V. to be 83·0 ± 1·5 which was in no way different from that of an adult. It is rather surprising and difficult to explain.

Mean corpuscular volume on the fourth day.—Like the other haematological values M.C.V. of neonates show the decline on the fourth day. Gairdner *et al* (*loc. cit.*) recorded fall by average 9·2 cubic microns while the present workers observed only 2·0 cubic microns fall. This was due to the difference in the degree of fall in erythrocyte count. Wintrobe (1946) also found 2 cubic microns fall. When the present data was statistically treated the fall was found to be significant. So out of 100 newborn babies at least 95 babies would manifest a fall of M.C.V. on the fourth day.

Mean corpuscular haemoglobin (Tables 1 and 3).—The average haemoglobin content of each erythrocyte was 33·84 ± 1·38 micro micrograms on the first day and 33·9 ± 1·5 on the fourth day. The coefficient of variation was 3·1 and 4·1 per cent respectively. The values ranged between 30·9 to 36·6 micro micrograms.

Unlike the other values it did not show any decline on the fourth day. All the workers mentioned in Table 3 observed similar results. Thus the observation indicates that red cells of a newborn baby are always normochromic.

Mean corpuscular haemoglobin concentration (Tables 1 and 3)—The average mean haemoglobin concentration of the red cells was 31·4 ± 1·31 per cent on the first day and 31·8 ± 1·49 per cent on the fourth day. The results were similar on both the days. The range of variation was 28·78 to 35·78 per cent which was within the accepted normal range (32 to 36 per cent). These findings were in agreement with the findings of workers like Gairdner *et al* (*loc. cit.*) who found the average M.C.H.C. to be 32·6 per cent on the first day and 33·0 per cent on the fourth day. Chuinard *et al* (*loc. cit.*) recorded high normal values like 37·5 per cent and 39·5 per cent on the first and fourth day respectively. Horan (*loc. cit.*) found the average M.C.H.C. to be 32·7 and 33·1 per cent on the first day and fourth day from capillary blood. These results indicate that red cells at birth are fully saturated with haemoglobin.

Reticulocyte count (Tables 1 and 3)—The average reticulocyte count of the babies on the first day was 4·9 per cent. The value ranged between 2·7 to 6·8 per cent. The reticulocyte count gradually fell down to 1·2 per cent on the fourth day, the range being 0·4 to 3·0 per cent. Gairdner *et al* (*loc. cit.*) also recorded 3·9 per cent reticulocyte count on the first day and 1·3 per cent on the fourth day.

Birthweight and haematological values (Table 2)—Table 2 shows that haematological values were not significantly affected by the difference in birthweight when the gestation period varied from 39 weeks to 41 weeks. Here the babies belonging to weight group (7 lb. to 7 lb. 15 oz.) show the lower normal values such as Hb. 16·35 g. per cent, red blood cells 4·67 million per c. mm. and haematocrit 50·9 per cent. It was also evident that babies of higher birthweight (8 lb. to 8 lb. 15 oz.) group did not show lower values though Mackey (1933) suggested that haemoglobin level on the first day of birth varied inversely as the birthweight.

Comments

The observations done so far show that the haematological values in the prenatal period are essentially different from that of an adult. A new born baby has more haemoglobin and more red cells of larger size. Another peculiar feature is that the haematological values of the newborn babies manifest a fall on the fourth day except in M.C.H. and M.C.H.C.

This interesting feature of neonatal haematology must have an intimate relationship with foetal haemopoiesis in the intra-uterine as well as in the extra-uterine life. Whether the latter is a continuation of the former or both of them are quite different in nature and the factor or factors which modify the haemopoiesis at this stage, are yet to be determined.

The foetal haemopoiesis starts working in the mesenchyma of the yolk sac when the foetus is 21 days old. At the age of three months of intra-uterine life, the liver and the spleen act as blood-forming organs. The hepatic haemopoiesis continues and becomes maximum at 38 weeks of intra-uterine life as shown by the presence of maximum number of haemopoietic foci in the liver of 38-weeks-stillborn babies (Langley, 1951). From the 5th month of foetal life the bone marrow takes up the function of erythropoiesis with its limited capacity till the foetus is born. As the foetal blood is only 65 per cent saturated with oxygen, the haemopoietic system is stimulated to produce more haemoglobin and erythrocytes, and thus upto 38 weeks both extramedullary and medullary haemopoiesis become active to meet the demand. After this period the bone marrow seems to have taken up the function as evidenced by high normoblastic

reaction (60 per cent) of the bone marrow at birth (Shapiro and Bassen, 1941). The hyperactivity of bone marrow may be responsible for high output of haemoglobin and erythrocytes in the system.

Changes in the extra-uterine life—Any discussion about neonatal haematology is incomplete if the spectacular change in the haemodynamics of the neonates associated with birth is not considered. As soon as the baby is born and the umbilical cord is tied it cannot subsist as a biological parasite. With the respiratory activity, the baby becomes physiologically an independent being. It is the findings of workers of neonatal haematology that the value of erythrocyte, haemoglobin concentration and haematocrit values are higher in blood on the first day than that obtained from the cord blood. The haematological value of the cord blood, however, represents the value in a baby before its birth.

When the placenta and cord are not separated from the mother or in other words just at birth 100 to 140 ml. of blood remain in the cord and placenta and thereby outside the body of the foetus. So it is expected that the haemoglobin value per 100 ml. of blood should be the same both inside the body and in the cord at that time. The rise of haemoglobin concentration, erythrocyte count and haematocrit value within a few hours after birth cannot be explained on its getting back its own blood from the cord and placenta. This rise may be due to haemoconcentration or due to increased erythropoiesis at that time. Demarsh *et al* (1942) and Mollison and Cutbush (*loc. cit.*) observed the effect of timing of ligation of the cord and suggested that clamping of the cord after cessation of pulsation, raised the haemoglobin by 2 to 6 g. per cent on the first day, and there was also rise in packed cell volume with diminution of plasmacrit. Mollison (1951) observed that this was due to extrusion of plasma from the blood. On the other hand, Chuinard *et al* (*loc. cit.*) and Gairdner *et al* (*loc. cit.*) recorded the postnatal rise even when the cord was clamped early. This change, the latter authors thought, was due to readjustment of the whole body fluid after birth leading to seepage of plasma water to adapt itself to extraneous circumstances. On the other hand, Wegelius (1948), quoted by Smith (1951), was of the opinion that this rise was due to increased erythropoiesis as a result of anoxaemia produced by the increased demand for oxygen consumption by the baby. This assumption seems to have no direct evidence. Mollison (*loc. cit.*) suggested that extra-uterine adaptation became stable at least three hours after birth. Hence it can be assumed that haematological investigation will furnish consistent and reproducible results after 3 hours of birth. In this work therefore blood was drawn from the newborn infants after 6 hours but within 24 hours to establish the normal data on the first day of birth.

The discussion so far indicates that the haematological values on the first day of life may be handicapped by two limitations. The first one is the absence of any consensus of opinion and practice about the early or late ligation of the cord among the obstetricians. The second one is the degree of readjustment of the body fluid in the neeonatal period which is not uniform in all the cases.

Macrocytosis of neonatal red cells—Erythrocytes of newborn babies are macrocytic. According to Wintrobe (*loc. cit.*), M.C.V. of the foetus of 120 days is 130 cμ, and it gradually decreases as the foetus grows. Van Crevald (1932) and Dutta Chaudhuri (1936) recorded mean diameter of red cells to be 8μ, and $7{\cdot}48 \pm 0{\cdot}44\mu$ respectively in the perinatal period by Price Jones' curve method. The works of Hurtado *et al* (1945) and Prader *et al* (1950) suggested that anoxaemia in the intra-uterine life may be the cause of macrocytosis as the dwellers of high altitude and infants with cyanotic heart disease show an increased M.C.V. But it fails to explain the gradual diminution of the size of the cells in the latter months of foetal life when the oxygen saturation is still lower. Langley (*loc. cit.*) observed some correlation between the large erythrocytes and hepatic haemopoiesis. He is of opinion that these large cells are derived from the liver, and they gradually disappear from foetal blood in later months of pregnancy and are replaced by smaller cells originating in bone marrow from the 5th month onwards. The simultaneous presence of large and small cells in the blood smear at this stage of life lends support to this hypothesis.

Fall on the fourth day—The progressive fall of haemoglobin, erythrocytes, haematocrit value, and M. C. V. on the 4th day represents an interesting feature of neonatal haematology. This decline is found to be statistically significant. Parson (1933) postulated the idea of excessive haemolysis following birth. Davidson *et al* (1941) put forward the explanation that excessive haemolysis may be due to sudden release of anoxaemia. The mechanism of the destruction of the red cells by oxygenation *in vivo*, however, is not understood. Josheps (1932) forwarded the theory of diminished production of erythrocytes during the first week of life. His theory has been corroborated by bone marrow study of the neonates of the first day and seventh day by Shapiro and Bassein (*loc. cit.*) and Gairdner *et al* (*loc. cit.*). The normoblast in bone marrow gradually fell from 32

per cent to 12 per cent on the 7th day in former workers' series and from 43 per cent to 8 to 10 per cent on the 7th day in the latter's series. Fall of reticulocyte count from 6 per cent to 0·3 per cent also indicates diminished erythropoiesis. Langley (*loc. cit.*) suggests that this postnatal fall is due to recession of extramedullary haemopoiesis after birth ; as a result of this large number of cells of bigger size orginating from the liver disappear from the circulation. Barcroft (1946) hinted that the rapid disappearance of foetal type of haemoglobin from the circulation after birth might be one of the factors responsible for the fall in the haemoglobin value on the 4th day.

Summary

Findings on the haematological investigations made on venous blood from fifty mature newborn babies of normal mothers are recorded.

All the haematological values other than M. C. H. and M. C. H. C. showed statistically significant fall on the fourth day, the average values *on the first day* being : Haemoglobin—17·18±1·13 g. per cent, erythrocyte—5·01±0·33 million per c.mm., haematocrit—54·55±3·3 per cent, M.C.V.—107·2±4·05 cμ., M.C.H.—33·8±1·33 $\gamma\gamma$, M.C.H.C.—31·4±1·31 per cent and reticulocytes—4·9 per cent ; and *on the fourth day* haemoglobin—16·05±0·92 g. per cent, erythrocytes—4·71±0·34 million per c.mm., haematocrit—49·9±3·52 per cent, M.C.V.—105·0±3·75 cμ., M.C.H.—33·9±1·5 $\gamma\gamma$, M.C.H.C.—31·8±1·49 and reticulocytes—1·2 per cent. Red cells of newborn babies of normal mothers were always macrocytic and normochromic.

The method of correction of haematocrit reading for trapped plasma in the cellular column has been described.

The haemoglobin, erythrocyte count, and haematocrit values on the first day of life were found to have no relationship with the birthweight of mature babies when the gestation period varied from 39 weeks to 41 weeks.

Possible factors responsible for the variation of the haematological values have been discussed. The possible explanations for the fall of haematological values on the fourth day have been suggested.

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CASE NOTES

A CASE OF LEPROSY MISTAKEN FOR NERVE TUMOUR

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In November, 1955, a businessman, aged 22 years, attended the Out-patient Clinic of the Leprosy Research Department, School of Tropical Medicine, Calcutta, with the following history:

About 10 years back in 1945 while playing football he received an injury on the dorsum of the right foot resulting in an ulcer. The ulcer, however, healed up but the part became anaesthetic. The anaesthesia gradually spread over the foot, but he did not notice any change in the colour of the skin. On medical advice, he had some external application but without any relief. Later on, he developed some stiffness with slight swelling of the right ankle joint and a small sore developed on the right heel.

About August 1955, he was admitted into a hospital with a trophic ulcer, anaesthesia and foot-drop for removal of the tumour of the sciatic nerve. An exploratory operation was performed. The sciatic and popliteal nerves were found to be thickened and many fusiform swellings were noticed. On incision of one of the swellings, caseous material came out which led to the suspicion of leprosy, and the wound was closed.

On examination there was right foot-drop, with a trophic ulcer on the right heel. There was also wasting of the muscles of the right leg, specially of the extensors.

A hypopigmented ill-defined anaesthetic patch was present extending from the dorsum of the right foot upto the lower third of the right leg. Small ill-defined hypopigmented anaesthetic patches were also present on the left forearm and the right ear. Loss of sensation to light touch and pin-prick was present in the whole of the right foot and a small distal portion of the right leg. There was thickening of right posterior tibial, right lateral popliteal and right great auriculur nerves.

Smears from the skin lesion, ulcer and the nose by routine slit and scrape technique were negative for *M. leprae*.

DIAGNOSIS

The patient was diagnosed as a case of leprosy and classified as maculoanaesthetic form of non-lepromatous type of leprosy with polyneuritic changes (MA_2P_1).

COMMENTS

Possibility of leprosy should be remembered before diagnosis of a nerve tumour or neurofibroma is made.

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ARSENICAL ENCEPHALOPATHY

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The following case of arsenical encephalopathy complicating oral acetarsol therapy is reported for it is not sufficiently appreciated that oral arsenical preparations such as acetarsol may at times prove as dangerous as parenteral preparations.

CASE REPORT

J. S., a 14 year old male, weighing 80 lb., was admitted with history of dry cough occasionally attended by mucoid expectoration for 5-6 months, irregular fever for 2 months, loss of weight and appetite for 1 month, and weakness for 1 month. There was nothing significant in the family or social history. The patient suffered from no significant illness in the past except an attack of typhoid fever some 4 years ago.

On examination he looked thin, emaciated, and moderately anaemic. There was, however, no other selective deficiency pattern. The temperature was 101°F, respiration 18-20/p.m., pulse 84-88/p.m., B.P. 110/70 mm. Hg. Auscultation of the chest revealed scattered crepitations on both sides. There was no other abnormality in any other system.

Laboratory investigations: Blood was examined (Table 1). W.R.—negative, x-ray chest—heavy striation in both lungs with mediastinal widening. Mantoux was positive 1 in 1000. Sputum, urine and stools—no abnormality.

A diagnosis of eosinophilia lungs was made. The patient was put on acetarsol tablets orally—1 tablet (4 gr. each) three times a day. All seemed to go well clinically and haematologically (Table 1).

There was relief in cough; temperature, however, was not significantly affected. Tetracycline orally was started and the temperature came down from 103°F to 100°F. On 12-2-56 (7th day of acetarsol therapy) the patient was improving,

TABLE 1—SHOWING BLOOD PICTURE BEFORE AND AFTER THERAPY

Date	Hb. (g. %)	W.B.C./ c.mm.	Absolute eosinophil count/c.mm.	Polymorphs	Lymphocytes	Monocytes	Eosinophils
				per cent			
4-2-56 (before treatment) ...	9	20,050	9,820	34	17	0	49
8-2-56 (4th day of treatment)		11,800	5,074	34	20	3	43
10-2-56 (6th day of treatment)		7,400	2,072	23	45	4	28
26-6-56		9,550	286	35	61	1	3

looked happy and had no complaints. In fact, he was being considered for discharge and to continue treatment under observation at the children clinic. Quite unexpectedly at about 3 P.M. when he was talking to his parents sitting in the hospital garden, he felt warm, complained of headache and within a few minutes started having generalised convulsions and soon became unconscious. He was picked up and brought into the ward. Convulsions continued for some half an hour and unconsciousness deepened. He vomited 5-6 times during the night. Fundi—normal. The C.S.F. (½ hour after the episode) was clear, with increased tension, protein, 50 mg. No other abnormality chemically or microscopically was present.

Acetarsol was immediately stopped. Dehydration regime with hypertonic I.V. glucose, saturated Mag. Sulph. rectally, sedatives and massive doses of vitamin B complex and ascorbic acid were given. All this made no difference and by the next morning his condition rapidly deteriorated—coma further deepened with complete loss of sphincter control. Pupils were, however, normal and reactive. Deep jerks were brisk with extensor plantar response. Throat was slightly congested. The patient passed 3 loose stools and had two further convulsions. There was no clinical jaundice nor erythema or any other exanthem. B.P. was 150/95 mm. Hg.

Respiration was noisy with Cheyne-Stokes breathing. The profound coma, grunting breathing with death rattle and loss of swallowing reflex with mucus collecting in the throat from bulbar paralysis forecast the gloomy outlook.

With no other cause to account for coma and in view of arsenic therapy (21 acetarsol tablets in 7 days) the diagnosis of arsenical encephalopathy seemed most likely, even though hair and nails revealed no arsenic and there was no abnormality in the urine. Liver function tests—normal. B.A.L. was started some 16 hours after the episode. There was no significant improvement for the next 24 hours. Cortisone 100 mg. I.M. stat, 25 mg. 8 hourly was added at this stage some 40 hours after the acute episode and one day after B.A.L.

For another 2 days after this combined treatment, there was no significant improvement and the patient literally struggled between life and death, especially as throat secretions threatened suffocation. Repeated throat suction and oxygen administration, however, kept him going.

On the third day, he took a new turn, throat secretions lessened, breathing became quieter and easier and pinching the leg elicited response. Tendon jerks were no longer brisk, the right plantar became flexor, left showed no response. Cortisone, B.A.L. along with hypertonic glucose I.V. and saturated Mag. sulph. rectally and vitamins B complex and C were continued. The patient maintained steady improvement and was mentally clear on the 8th day of B.A.L. and cortisone therapy. He could feed himself, dress and undress. He was once again his normal self except feeling somewhat weak and complaining of headache and some tenderness in the right leg.

The total dose of cortisone (from 14-2-56 to 23-2-56) was 812.5 mg. and that of B.A.L. (from 13-2-56 to 19-2-56) was 26 c.c.

The patient has been followed weekly up-to-date. He has no complaint and there are no abnormal findings in any system. Liver function tests, urine analysis repeatedly proved normal.

DISCUSSION

Arsenical encephalopathy, though rare, is a grave complication of treatment with arsenobenzene derivative. There is no way to anticipate it. It comes with little or no warning. Though it occurs apparently without relation to age or sex, the younger ones are said to be more prone. Alcoholism and pregnancy may act as predisposing factors. Pathologically it is haemorrhagic encephalopathy.

Acetarsol is a synthetic organic pentavalent arsenical. Although it is given by mouth it is capable of giving rise to the same group of toxic manifestations that follow I.V. arsphenamine. Its effective dose nearly equals the toxic dose.

SUMMARY

A case of arsenical encephalopathy following oral acetarsol and resulting in complete recovery is reported.

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THE PROBLEM OF NORMALITY

It has been suggested by an eminent person of the engineering profession that realisation of our ignorance is the most significant discovery of the present century. The statement though not without an element of surprise in it will nevertheless be accepted with due humility by students everywhere. In the past few decades many a hard core of our accepted beliefs, like Humpty Dumpty, had a great fall ; 'normality' is only a minor casualty. The expression normality is in common usage not only in sciences like medicine and psychiatry but it also makes incursions in subjects like ethics and economics ; yet we find it not easy to define. Definitions of normality, judged in their diverse context, may be broadly classified into two categories. First, an event may be considered normal if it occurred most often under similar circumstances. Another type of definitions, mostly used in social sciences and the humanities, relies for its recognition on the strength of social acceptance of acts and values. It may not be denied that the latter category of definitions is based on the former, unawares though, and for this reason it deserves viewing somewhat more critically.

A definition of normality constructed on the frequency of occurrence is essentially statistical in nature, involving the use of the concept of probability. The norm thus arrived at is the aggregative tendency in a set of events of similar nature ; it is merely an index of the observations already made and which may be profitably used as a clue for foreseeing the future. It is exactly here that we encounter the danger which may arise out of any rigid use of this concept. The average (normal?) height of the Indians may have remained, say, 5′ 6″ for the last thousand years, but this fact in itself is no guarantee for the index to remain unaltered for all time to come. Norms pertaining to vital statistics, incidence of a particular disease, natural endowments, etc., have been observed changing in magnitude and dimension. A statistician with an assuring nod might add : it is for this reason that the 'measures of variability' are considered indispensable for the evaluation of any 'measure of central tendency'. The latter technique is employed to reveal the extent of homogeneity in the data in a group, whereas the former is meant to expose the heterogeneous tendency among the data. In other words, if it be ventured to determine the normality of an incident, the extent or range within which this specific event might be expected to occur needs also be stated clearly. Biologically speaking, normality is not a state but a phase in the everchanging facets of the organism.

Once we accept this tentative exposition of normality, we may not fail to notice the semblance underlying the two definitions earlier mentioned. The norm as viewed in a frequency curve holds the intermediate position on the x-axis which extends from the minimum to the maximum possibilities of the events. That is to say, the norm represents the equilibrium maintained between two opposing forces in action. Likewise may be visualised the concept of normality used in the social context. In our accepting a specific line of thought or action we have to reject some others opposing it. The social values of human civilisation have thus evolved out of the conflicting trends of views, faiths and dogmas held from time to time. Resistance and conflicts form not only the foundations of social evolution but are now held as implicit ingredients in psychosomatic evolution.

It would be a truism to say that each organism is in a state of evolution, the nature of which is no longer conceived as the playways of genes. Biologists are of opinion that "the kind of organism which will develop depends not only on genes but also on the nature of the environment in which the genes exert their influence".[1] If this be the fate of genes which until recently were treated like omnipotent micropotentates in matters of organismic development, we may only conjecture about the rest of the inherent potential factors responsible for development. Furthermore, works of Müller, Fisher and others encourage us to rule out safely the possibility of evolution taking place 'fortutiously without the operation of selection'.

It is admitted that the potentialities in an organism can survive and thrive on condition that these met with favourable circumstances. But the expression 'favourable' may not be fancied in the sense of passive pliability. Among other conditions, a minimum of resistance against the action is a necessary adjunct to the latter's continuance and survival, though not resistance too strong to

[1] ZUBEK, J. D. AND SOLBERG, P. A.—Human Development, MacGraw Hill, 1954.

forestall the action. Viewing in this perspective we may not fail to notice that each element for survival, each function and structure of the organism has its specific opponent against which it has to struggle, and at the same time co-ordinate itself. In other words, each function of the organism, physical or mental, is the outcome of a conflict of two forces moving in opposite directions. Sherrington's Law of Reciprocal Innervation and Cannon's conception of Homeostasis are perhaps the most illuminating illustrations in this direction. The internal mechanisms are constantly alert in balancing each other's functions (not to the extent of nullifying though) and the outcome has to match against another set of reciprocal co-ordinated antagonisms arising elsewhere. This way a hierarchy of structure and functions of the organism has evolved from microcellular action patterns to macrobehaviour patterns. It is of course presumed here that what we call environment continues to participate actively in this process. About the complexity of the problem a broad hint was given by Huxley in his statement, ". . . no single component of the evolutionary process can be understood without reference to others".[2]

Out of the ceaseless conflicts there has grown another phenomenon, viz., adaptation, which contributes considerably to our understanding of the concept of normality. Adaptation may be a temporary phase, as it happens in long exposure of the eyes to bright light resulting in the raising of visual acuity. It may, also, be a comparatively durable phase giving rise to the so-called individual differences. Adaptation, on the other hand, if continued over a prolonged period, may result in permanent or quasi-permanent changes in the organism. Immunity is a suitable example. The topic of adaptation of the body to the effects of nuclear energy liberated on a large scale was discussed in these pages recently.[3]

A word about conflict. It is not in the nature of one nascent or quiescent state being reacted upon by an external or 'aggressive' element, but as both the opposing trends growing dynamic properties gradually evolving for the benefit of the organism as a whole. Anyway, a pattern of conflict continued over generations may finally bring about certain alterations in the structures, mutations if we prefer, the additive value of which may perhaps be appreciated only after a very long time. "Contrary to the earlier views of de Vries and Bateson and others" as Huxley has observed, "it is mainly small mutations which are of importance in evolution . . . Evolutionary change is almost always gradual and is almost wholly effected through selection".[2]

The role of conflict *cum* adaptation in the maintenance of normality in the mental field has received adequate treatment in the hands of experimental psychologists and psychiatrists.

To sum up, normal behaviour lies in the bidimensional adjustment process constantly occurring in the organism beginning with microcellular structures and functions evolving hierarchically to the macrobehaviour patterns in man as a psychosomatic whole in the midst of his species and within the wider orbit of natural environs. Normality from this point of view ceases to be a static state and may be conceived as a limited dynamic field in the chain of action-reaction process. A semantist therefore may look with disapproval at our

[2] HUXLEY, JULIAN—Evolution as a Process, George Allen, 1954.

[3] Editorial—*J. Indian M. A.*, **27** : 64, 1956.

enquiry: is the heart normal? He may advise instead to remodel the querry: under the conditions can the heart take it? Whereas an answer to the former inquiry may be a naive yes-or-no, we have no language to portray the latter answer which would have to take cognisance of the heart not only as it is but also as it was in this particular individual. On the bases of these two pieces of information may we be allowed to conjecture about its future, and this precisely is our aim in questioning—is the heart normal? To describe what we mean by normal we have not only to examine the structure-function continuum but have to take into consideration the prevailing position of the opposing-coordinating forces in action. That this is not an easy task we are well aware of; "when an organism is . . . in process of evolution, the biologist may either concentrate on its evolutionary history, or he may concentrate on its position, which is the stage of evolution it has attained, but he cannot concentrate on both of them".[4] Nonetheless we can feel the drag on progressive thinking when the older static concepts are tenaciously adhered to. Life and death, for instance, do not constitute a set of two unrelated phenomena but form a continuously functioning interdependent whole; every day of our survival decreases the life span to that extent nearing death proportionately.

In the case of man, the situation grows in complexity. Once the vertebrates reached the highest mammalian stage and labelled *Homo sapiens*, the mechanism of evolution ceased to be a replica of what we find in the lower animals. "Man is changing his environment; and his problem is no longer how to adapt himself to the natural universe, but how to adapt himself to the artificial universe of his own creations".[5] Animals have either to fight and win (inhabiting the arctic they may grow fur), or lose and become extinct, or flee (as birds migrate). But man endeavours to *control* his environment. Not only does he produce heat or reduce it according to his need but also may venture to the extent of changing the topographical picture of the earth as by growing tree belts or by altering the course of rivers. Industrial revolutions have opened enormous possibilities of controlling nature and changing it. Would it be far-fetched to presume that thereby he too may be changing himself. The awe-inspiring technical changes, let us remember, have appeared very recently. As someone has aptly suggested that judged against the age of our earth, the total impact of the technical revolutions may be reckoned as a sudden explosive intellectual outburst on this planet when measured in terms of the celestial time scale. In the course of millions of years we have grown adaptability to our surroundings imperceptibly slowly and have developed ways of living in harmony to the abilities and capacities of the human organism. How the sudden changes are going to react on the body and the mind is a grave problem facing us; on its solution would depend the course of our future normality. To consider a simple instance, with the introducing of full-fledged automation in industry man's functions will be gradually reduced to pushing buttons, and then changing gears may be considered tantamount to heavy manual work. How this kind of soft living will be matched against the increasing amounts of vitamins and proteins that he may be then consuming? In the realm of mind neurosis is price which man pays for the control of his instincts in the service of a higher order of existence.

[4] HOPWOOD, A. T.—Influence of Physical Theory on Biological Thought, *Nature*, **9**: 7, 1949.

[5] Impact of Science on Society, UNESCO, Vol. III, No. 3, Cybernetics and the Future of Man: R. Valleé.

CURRENT MEDICAL LITERATURE

Neurological and Psychiatric Signs in Systemic Lupus Erythematosus

CLARK AND BAILEY (*J. A. M. A.*, **160** : 455, 1956) write that recorded signs or symptoms of neuropsychiatric disease were present in the clinical records of 28 of 100 cases of systemic lupus erythematosus. Seventeen of the 28 patients had evidence of psychic disturbance, and 24 had neurological dysfunction. The onset of these difficulties was usually not associated with cortisone or corticotropin therapy, uraemia, hypertension, or the last week of the patient's life. From a neurological standpoint, generalised and focal convulsions, hemiplegia, double vision, choked disks, polyneuritis, subarachnoid haemorrhage, nystagmus, vertigo, choreiform movements, monoplegia, paraplegia, quadriplegia, aphasia, intention tremor, neuropathy of facial nerve (Bell's palsy), cortical blindness and the decerebrate state were noted. Psychiatric findings associated with the disease were symptoms of anxiety associated with fear of impending disaster, personality changes, and memory defects. Other manifestations were emotional lability, mental deterioration, depression, hallucinations occurring with fever, and paranoid and obsessive reactions. Clinical evidence of transient or permanent involvement of any part of the nervous system may appear during the course of systemic lupus erythematosus.

Finger-nails in Chronic Hypoalbuminaemia

MUCHRCKE (*Brit. M. J.*, **1** : 1327, 1956) describes a previously unrecorded physical finding of paired white bands in the finger-nails of hypoalbuminaemic patients.

This finding is unique because it reflects a specific biochemical abnormality—chronic hypoalbuminaemia.

Although white bands are most often seen in patients with the nephrotic syndrome, they are not specific for any one disease state.

Paired white bands do not regress with vitamin therapy, but they will disappear when the serum albumin is maintained above 2·2 g. per 100 ml.

Rapid Test for Adrenocortical Insufficiency

PERLMUTTER (*J. A. M. A.*, **160** : 117, 1956) in giving a preliminary report on the evaluation of the rapid test for adrenocortical insufficiency observes :

Hyponatraemia associated with medical or surgical shock may be due to extrarenal salt loss or deprivation; this status is associated with a decreased urinary salt concentration. On the other hand, hyponatraemia due to either renal tubular damage or adrenocortical insufficiency is associated with increased urinary saline concentration. A rapid, simple test consisting of simultaneous determination of the concentration sodium in the serum and urine by means of a flame photometer will differentiate between these two groups of patients without delaying the initiation of therapy. Studies to extend this observation further and to use this method to predict the reserve status of adrenal function are in progress.

Abnormal Cells in Ulcerative Colitis

BODDINGTON AND TRUELOVE (*Brit. M. J.*, **1** : 1318, 1956) write that examination of colonic epithelial cells by Papanicolaou's method has revealed that abnormal cells are often present in ulcerative colitis.

In their most pronounced form the abnormal cells are much enlarged and possess large nuclei with prominent nucleoli and a disturbed chromatin pattern. These abnormal cells may be found in any patient with abnormal sigmoidoscopic findings, but are most frequent in patients with severe disease. They are commonly found in patients in their first attack of ulcerative colitis.

There seem to be three possible explanations for the occurrence of these cells : (1) they are to be expected whenever the colonic epithelium is provoked into vigorous regenerative activity by extensive damage, from whatever cause; (2) they represent a primary epithelial disturbance in ulcerative colitis, as, for example, a maturation arrest due to the absence of a specific factor necessary for epithelial development; and (3) they are abnormal cells secondary to severe inflammation in the colonic mucosa.

The abnormal cells have many of the features of malignant cells, a point of interest in view of the fact that patients with ulcerative colitis are unduly liable to develop carcinoma of the colon.

Renal Lesions of Sulphonamide Type after Acetazolamide

GLUSIEN AND FISHER (*J. A. M. A.*, **160** : 204, 1956) report that a patient with Hodgkin's disease who received acetazolamide (Diamox) for four days showed no clinical evidence of renal failure or sulfonamide intoxication, yet at autopsy 24 days later renal lesions indistinguishable from those produced by the antibacterial sulfonamides were present. Occurrence of renal lesions following the administration of acetazolamide has not heretofore been reported.

Thrombocytopenia Following Acetazolamide Therapy

REISNER AND MORGAN (*J. A. M. A.*, **160** : 206, 1956) report of an 85 year old man admitted to St. Luke's hospital with purpura and bleeding from the rectum following the use of acetazolamide (Diamox) 250 mg. three times a day for one week as a diuretic for congestive cardiac failure. Prior to this the patient had on two occasions shown some bleeding or bruising tendencies which, however, were associated with episodes of obstructive jaundice and when the prothrombin level was measured it was found to be low. There was no laboratory evidence then of thrombocytopenia. The bleeding tendencies subsided promptly when the jaundice and hypoprothrombinaemia were relieved and may thus justly be attributed to that cause. The bleeding on the last admission is directly attributable to thrombocytopenia and on clinical ground one could at once suspect acetazolamide (Diamox).

Evaluation of Drugs for Protection against Motion Sickness

The following is the summary of the report of study by army, navy, airforce motion sickness team on the

evaluation of drugs for protection against motion sickness aboard transport ship:

Twenty-six compounds have been tested against seasickness in soldiers and airmen crossing the North Atlantic aboard troop transport ships. A total of 16,920 subjects completed the experiment. Three compounds, cyclizine (Marezine) hydrochloride, meclizine (Bonamine) hydrochloride, and promethazine (Phenergan) hydrochloride, were tried at two different dosage levels, making a total usage of 29 drugs and a placebo. Fourteen of the drug regimens gave significant protection at the 1 per cent probability level: meclizine, three times and one time daily; cyclizine, three times and two times daily; promethazine, three and two times daily; and N-benzhydryl-N-*m*-methylbenzylpiperzine (UCB 158); benztropine (Cogentin) methanesulfonate; buclizine (Vibazine) hydrochloride; ethopropazine (Parsidol) hydrochloride; dimenhydrinate (Dramamine); diphenhydramine (Benadryl) hydrochloride; 1-methyl-4-amino-N'-phenl-N'-(2'-thenyl)-piperidine tartrate (Sandostene); and pheniramine (Trimetone) maleate three times daily.

Of the effective agents, use of 50 mg. of meclizine, once or three times daily, 50 mg. of cyclizine, three times daily, and 25 mg. of promethazine, three times daily, was significantly more effective than use of other drug regimens. The following preparations were ineffective in the study: alseroxylon (Rauwiloid), racemic calcium pantothenate, 1-dimethylamino-2-(2'-benzyl-4' chlorophenoxy) ethane hydrochloride (BL-717), chlorpromazine (Thorazine), beta-diethylaminoethyl phenothiazine-10-carboxylate (Transergan), scopolamine methobromide (Pamine bromide), hyoscine B. P., phenyltoloxamine (Bristamin), pyrathiazine (Pyrrolazote) hydrochloride, pyridoxine, reserpine (Serpasil), scopolamine hydrobromide U.S.P., thiamine, and N(b-methyl-b-trimethylammoniumethyl) phenothiazine methyl sulfate (Multergan). There was no apparent difference between British and American varieties of scopolamine hydrobromide.

Seasickness varied inversely with age. Individuals quartered fore and aft were more susceptible than those midship. There was no racial predisposition. Heavier individuals were slightly, but not significantly, more susceptible than their lighter colleagues. No relation could be observed between duty aboard ship and susceptibility. The highest incidence of side-effects was seen with American and British supplies of scopolamine hydrobromide and with the Rauwolfia alkaloids. Among effective compounds, benztropine caused a significant increase of drowsiness, dry mouth, and blurred vision; ethopropazine, dry mouth and drowsiness; and promethazine, drowsiness. No other effective agent showed a higher incidence of any side-effect than did the placebo. (*J. A. M. A.*, **160**: 755, 1956).

Myleran in Treatment of Chronic Myeloid Leukaemia

BLACKBURN AND OTHERS (*Brit. M. J.*, **1**: 835, 1956) give in the following lines the summary of their observations on the treatment with "myleran" (1:4-dimethanesulphonyloxybutane) of 17 cases of chronic myeloid leukaemia and one case of neutrophilic leukaemia. Optimum dosage appears to average 0·06 mg. per kg. body weight per day by mouth. With larger doses thrombocytopenia may occur. Of eight cases not previously treated, seven had satisfactory remissions. The eighth case was one of neutrophilic leukaemia. Four out of six radio-resistant patients and three out of four who had had previous irradiation but were not radio-resistant had satisfactory remissions.

Of the 13 patients who have died, the terminal event in seven was acute relapse.

If radiotherapy is not available or is contraindicated, or if the patient is radioresistant, then 'myleran' can be used justinably. Although it is preferable to other chemotherapeutic agents, with the possible exception of demecolcine, the best palliative therapy for chronic myeloid leukaemia that has stood the test of time is radiotherapy. Myleran at present does not appear to be superior to radiotherapy, but we cannot yet answer the question, "Is myleran an effective substitute?"

Prednisone in Allergic Diseases

FEINBERG AND FEINBERG (*J. A. M. A.*, **160**: 284, 1956) write that prednisone was compared with cortisone as to potency and side-effects in 80 patients with allergic disease. Of 50 patients who had perennial chronic asthma, 41 obtained complete or nearly complete relief with the doses of prednisone that they were able to tolerate. Good or fair results were also obtained with the other types of allergic disease studied. The results were poor only in one case of seasonal allergic rhinitis.

Most of the patients obtained improvement from prednisone in doses about one-fifth those required with cortisone. Side-effects of prednisone included gastric complaints, euphoria, increased appetite, and overstimulation. None were serious. Oedema was encountered in one patient, rounding of the face in six, and urinary frequency in seven. It appeared that prednisone is far less likely than cortisone to lead to fluid retention.

Tumours of the Testis

BANERJEE AND OTHERS (*Indian J. Surg.*, **18**: 100, 1956) from a histopathological study of 66 testicular tumours obtained from six institutions in India observe:

The study was made by three different methods; (*i*) serial-slab technique, (*ii*) 'whole-slice method' and (*iii*) multiple-tissue blocks from different parts of the tumours.

The incidence of testicular tumours in relation to the malignant tumours in the male was found to be 1·04 per cent and 10·7 per cent of the tumours were in the cryptorchid testis.

Seminoma was the most common tumour (33 cases) representing 50 per cent of all testicular neoplasms. Detailed histopathological study of thirty-three seminoma did not reveal any evidence of teratomatous elements in these tumours. In three other cases the tumour showed both seminoma and teratoma but these two elements were found to be well separated from each other by thick fibrous bands. The observations support the findings of Willis and others that seminoma arises from seminal epithelium and has no histogenetic relationship with teratoma although the two may coexist in the same testis.

In nine cases a diagnosis of teratoma was made; six of the tumours also presented adenocarcinomatous appearances while the remaining three were benign. It is stressed that the diagnosis of benign teratoma should only be made after a thorough examination of the whole tumour. Studies of metastases in teratoma suggest dissemination from the main tumour mass of undifferentiated cells with potentialities of divergent differentiation.

A diagnosis of pure adenocarcinoma of testis was made in eleven cases and in one tumour, adenocarcinoma coexisted with seminoma. Evidence for a possible origin of these tumours from the seminal tubules is presented.

One case of pure choriocarcinoma, two cases of retecarcinoma, and two cases of lymphoma of the testis have been described and their histogenesis discussed. Three cases of fibroma and one of myogenic sarcoma are also described.

Partial Gastrectomy and Tuberculosis

THORN AND OTHERS (*Brit. M. J.*, **1** : 603, 1956) observe that of 955 patients undergoing partial gastrectomy for peptic ulcer, 60 (6·2 per cent) showed before operation a radiographic chest abnormality due to post-primary pulmonary tuberculosis. Eight of these (0·8 per cent of whole group) had a positive sputum at the time of operation.

At least one-third of the men and all the women who apparently developed pulmonary tuberculosis after partial gastrectomy already had abnormal chest x-ray films before operation.

After operation the annual attack rate of pulmonary tuberculosis in men with normal x-ray films before operation is high : this is due to the high attack rate in those already more than 15 per cent under their standard weight before operation.

If the chest x-ray film and weight are normal before partial gastrectomy there is not an abnormal risk of developing pulmonary tuberculosis later.

In men the association of pulmonary tuberculosis with peptic ulcer is more common in those with gastric than in those with duodenal ulcer.

The evidence shows that the development of pulmonary tuberculosis after partial gastrectomy is due to primarily to the presence of severe or long-standing peptic ulceration and only secondarily to the effects of the operation.

Knee Joint Punch Biopsy

ZEVELY AND OTHERS (*Am. J. Med.*, **20** : 510, 1956) from the analysis of the histologic study of the synovial specimens obtained by knee joint punch biopsy in 49 patients with diseases of the joints observe :

One complication occurred in the form of mild, transient, symptomatic haemarthrosis. Diagnoses made on the basis of this procedure included gout, rheumatoid arthritis, nropathic joint disease and tuberculosis. The procedure is considered an important and practical diagnostic method in joint diseases in those instances in which conventional arthrotomy is inadvisable and other measures have not revealed the diagnosis.

Postanaesthetic Nausea, Vomiting and Retching

KNAPP AND BEECHER (*J. A. M. A.*, **160** : 376, 1956) in reporting on the evaluation of the anti-emetic drugs dimenhydrinate (Dramamine), chlorpromazine and pentobarbital sodium write :

The anti-emetic possibilities of three drugs were studied in 554 surgical patients who were divided into five groups by using a table of random numbers. The contratest group (*a*) received a placebo in ampoules identified only by code letters; the test groups received (*b*) chlorpromazine, (*c*) 100 mg. of pentobarbital, (*d*) 150 mg. of pentobarbital, and (*e*) dimenhydrinate. The anaesthesia was nitrous oxide-ether.

Dimenhydrinate and pentobarbital in 100 mg. dosage were ineffective. Pentobarbital in the 150 mg. dosage and chlorpromazine effectively reduced postoperative nausea, vomiting, and retching, but they seriously lowered blood pressure and delayed awakening; in addition, the pentobarbital caused confusion and excitement. None of the four antiemetic procedures tried can be recommended for routine postoperative use.

Considerable protection against emetic symptoms was afforded by 150 mg. of pentobarbital given with a gastric tube in place. Females had more postoperative emetic symptoms than did males, but no difference was found in a comparison of intraperitoneal with extraperitoneal operations.

Haemorrhagic Diathesis in Prostatic Cancer

PROUT AND OTHERS (*J. A. M. A.*, **160** : 840, 1956) write that metastatic carcinoma of the prostate may produce haemorrhagic diathesis on the basis of bone marrow invasion or by the production of a proteolytic enzyme arising from prostatic tissue. Both mechanisms may be functioning simultaneously. Deficiencies in fibrinogen, prothrombin, Ac-globulin, and proconvertin may be present if spontaneous enzymatic activity is responsible for the haemorrhage. Spontaneous lysis of the patient's clot and lysis of a clot produced by mixing normal whole blood and the patient's plasma may also be observed; semenolysis, a new term devised to describe this activity has been suggested. Therapy with female hormones and orchiectomy will control the haemorrhagic diathesis if the tumour tissue is sensitive to hormones. If the haemorrhage is on the basis of semenolytic activity, human fibrinogen, fresh whole blood, and antihaemophilic plasma will produce a temporary cessation of bleeding.

Poliomyelitis in a Newborn Infant Due to Intrauterine Infection

SHELOKOV AND HABEL (*J. A. M. A.*, **160** : 465, 1956) write that type 1 poliovirus was isolated from a mother suffering from acute poliomyelitis and her infant born in a respirator. Serologic follow-up established conclusively that both patients had active infections with this virus type.

Presence of the virus in the substance of the placental villi coupled with its isolation from the rectal ampulla of the infant at delivery suggests probable intrauterine infection. This is probably the first recorded case of subclinical poliomyelitis in an infant born during the acute phase of maternal disease.

CURRENT TOPIC

VITAL STATISTICS OF CEYLON

The estimated mid-year population for 1954 is 8,385,000, which is an increase of 209,000 or 2·5 per cent. as compared with 1953 (220,000 or 2·7 per cent). It is of interest to note that the rate of population increase in 1954 is the lowest recorded since 1943 when the rate was 1·9 per cent. The rate subsequently rose to 3 per cent in 1944, and has ranged between 2·6 per cent and 3·2 per cent during the years 1945-1953.

(*b*) The rate of natural increase, i.e. the excess of births over deaths per thousand of the population for 1954 is 25·9 and this is less than the rates recorded in any of the previous years 1948-1953—the rate for 1953 being 28·5. The rate of natural increase in Ceylon for 1953 is only exceeded by Singapore (38·4), Venezuela (36·2) and Malaya (31·3) and that Ceylon has a very high rate of natural increase.

(*c*) The density of the Island's population was about 335 persons per sq. mile in 1954, the density at the 1946 census being 265 persons per sq. mile. In the census of 1951 the density of population of India and Pakistan is given as 315·4 per sq. mile and that of the United Kingdom—533.

(*d*) The marriage rate computed on the number of general and Kandyan marriages per thousand of the non-Muslim population was 5·9 for 1954, as compared with 6·1 in 1953, and an annual average of 6·3 for the 10-year period 1944-1953. The marriage rate over this period is comparatively stationary and that the marriage rates of some other countries show in general a downward trend.

Expectation of Life

(*e*) Our expectation of life which increased by 9 years for the 27-year period 1920-1946 from 33 to 42·8 years has increased to 51·8 in 1947, with subsequent steady increases in the following years to 59·8 in 1954, i.e., an increase in the expectation of life of 17 years in the 9-year period 1946-1954. This dramatic improvement in the expectation of life of Ceylon together with the improvements effected in the vital statistics rates of this country during the post second world war years up to 1949 has been described by the Division of International Health of the Federal Security Agency of the U.S.A. as "an event without precedent in the annals of world democracy and worthy of the very special attention of all public health workers."

Births

The birth rate for 1954 was 36·2 per thousand as compared with the 39·4 in 1953 and an average of 39·2 for the 10-year period 1944-1953. It is of interest to note that the birth rate for 1954 is the lowest recorded since 1940. It is also a matter of great importance whether the substantial decrease of 3·2 in the birth rate in 1954 as compared with 1953 will be maintained and further reduced in the subsequent years, as it will be a vital factor in the problem of control of population in Ceylon. Ceylon's birth rate of 39·4 in 1953 is only exceeded by Burma (49·2), Singapore (48·7), Venezuela (46·1) and Malaya (43·7).

Deaths

It is a matter for congratulation that the 1954 death rate of 10·4 per thousand of the population is the lowest ever recorded in Ceylon (10·9 in 1953), and is less than half of what it was 10 years earlier. This dramatic reduction in the death rate can be mainly attributed to the "demonstrated efficiency" of the residual spraying of D.D.T. in human habitations in the control of Malaria by the Department of Health's Anti-Malaria Campaign, together with other factors, including the exhibition of modern chemotherapy and antibiotics, the consolidation and further development of the curative and preventive divisions of the Department, and advances made in the general and health education and standard of living of the people. Ceylon's death rate in 1953 is amongst the lowest of the South-East Asian countries and compares favourably with other advanced countries.

Mortality of Children under 5 Years

The problem of the health of the pre-school child including the effects of malnutrition, hookworm and roundworm infestation, and inadequate environmental sanitation facilities in the urban and rural areas of Ceylon has received increasing consideration in recent years. The Government has sent a number of Medical Officers for specialisation in Paediatrics which speciality is one of those now approved for all provincial hospitals in the reorganisation scheme of the Department of Health. Children's wards are being planned in increasing numbers in the programme of new buildings and improvements to medical institutions of the Ministry of Health. The Registrar-General in his report on Vital Statistics for 1954 gives additional data and tables relating to the mortality of children under 5 years of age which are of value to those interested in the welfare of the pre-school child. The total deaths relating to children under 5 years registered in 1954 is 38,995. The total deaths for 1953 was 39,987, and the percentage of such deaths to the total deaths is the same for the 2 years (44·9) as compared with 46·3 in 1950. It is of interest also to note that 53 per cent of deaths under 5 years related to infants under one year of age. The death rate for children under 5 years of age in relation to the estimated population under 5 years of age was 35·9 per thousand in 1954 as against 37·9 in 1953. The rate has been over 60 per thousand prior to 1946.

Infant Mortality

The deaths of infants under one year of age registered in 1954 was 21,891 (22,869 in 1953). The death rate is 72 per thousand live births in 1954 as compared with 71 in 1953. This slight apparent increase in the infant death rate does not however represent a real rise in the infant mortality, as the standardised rate for 1954 was 69 as compared with the standardised rate of 71·5 for 1953. Although Ceylon has approximately halved its infant mortality rate for the last 10 years its rate is still very high as compared with certain European and other countries, indicating that a very appreciable number of infant lives can yet be saved each year.

The Director of Health Services in his Administration Report for 1954 observes that one-third of the babies born in the premier maternity institutions in Ceylon was immature (premature births). He also adds that, of the total infant deaths in the Island, 59 per cent die within the first month of life, and that 60 per cent of the causes of infant deaths and 75 per cent of the causes of all neo-natal deaths are assigned to prematurity, debility and convulsions.

Maternal Mortality

1,388 deaths from the complications of pregnancy, child-birth and puerperium occurred in 1954 as against 1,558 in 1953, an average of 2,513 for the 10-year period 1944-1954 and between 3,000-4,000 maternal deaths each year prior to 1947. The number of maternal deaths in 1954 approximate to half that in 1947.

The Registrar-General of Ceylon in his Report on Vital Statistics for 1954 observes that of the 1,388 maternal deaths registered in 1954, 234 were due to sepsis, pregnancy, child-birth and the puerperium, 400 due to toxaemias of pregnancy and child-birth, and 326 due to haemorrhage of pregnancy and child-birth. The Maternal Mortality Rate for 1954 is 4·6, the lowest ever recorded (4·9 in 1953). It may be noted that in 1945 the maternal mortality rate was 16·5 and whilst this dramatic reduction from 16·5 to 4·6 in 9 years is a matter for gratification, Ceylon's maternal mortality is still appreciably higher than those of the more advanced countries in Europe and the U.S.A.

Ceylon's Population Problem

Up to the end of the Second World War Ceylon had high birth rate and high death rates with gradual annual increases of population. With the continued high birth rates and the dramatic drop in the death rates for the period 1946-1954, Ceylon qualified to be included in the intermediate group of countries which have high birth rates and low death rates with the resultant rapidly expanding populations. If the drop in the birth rates of 3·2 from 39·4 in 1953 to 36·2 in 1954 is maintained and improved upon in the ensuing years, and if the existing death rates, infant and maternal mortality rates are similarly further maintained and improved upon, it is possible that Ceylon will, with the passing of the years, qualify to join the advanced group of countries which have comparatively low birth rates and low death rates and small annual increase of population with the resultant steadily increasing higher standards of living.

It may also be observed that Ceylon's dramatically improved vital statistics rates of recent years, with its resultant phenomenal annual rate of increase of the population, poses a major problem to the Government of the immediate need for the planning of additional employment, social services, housing, food and recreational facilities, population policy for the Island's phenomenally increasing population. The issue of the Government's "Six-Year Programme of Investment 1954/55 to 1959/60" is an indication of action being taken by Government in this connection. *(Health Progress in Ceylon—Ministry of Health, Government of Ceylon).*

NOTES AND NEWS

WHO Regional Director for Europe

The Regional Committee for Europe, meeting in Geneva under the chairmanship of Dr. A Sauter, Switzerland, elected on 12-9-56 in private session Dr. P. J. J. van de Calseyde as its nominee for the post of WHO Regional Director for Europe. The post became vacant as the result of Dr. Begg's death earlier this year. Dr. van de Calseyde's name will go forward for endorsement by the WHO Executive Board in January 1957.

Since 1945, Dr. van de Calseyde has occupied the post of Director General of Health at the Ministry of Health, Brussels. He is also a member of the WHO Expert Advisory Panel on Venereal Infections and Treponematoses, and has represented Belgium at World Health Assemblies and various WHO Committees.

WHO Helps Governments to Tackle Health Problem

The sincere hope that all international controversies would be settled peacefully and that the present generation would be protected from "a new and destructive war" was expressed by Dr. Saiful Anwar (Indonesia), outgoing Chairman of the South-East Asia Regional Committee of the World Health Organization, in his address to the ninth session of the committee which opened at New Delhi on 25 September 1956.

The session was attended by representatives from Afghanistan, Burma, Ceylon, India, Indonesia, Nepal, Portugal, Thailand and the U.K. Representatives of the UN, ILO, FAO, UNESCO, UNICEF and the UN Technical Assistance Board were also present.

Dr. Svasti Daengsvang, Director-General, Public Health Department of Thailand, was elected Chairman, and Dr. Raghubar Baidya, Director of Health Services, Nepal, Vice-Chairman of the Regional Committee for the ensuing term.

Dr. Anwar outlined the activities of WHO, which in close co-operation with other organizations and agencies, was working towards the common aim of creating "a world where every human being has his place and has the right to live a happy life, free from poverty, sickness and fear."

He added: "We are painfully aware of the reality that in an era of electricity and atomic energy, automobiles, radio and television, refrigerators and vacuum-cleaners are common tools of everyday life in many parts of the world, that in our region and in many countries outside our region still many millions of men today are living under circumstances constituting a continuous challenge to all who understand that disease and suffering, poverty and misery cannot warrant a peaceful world of tomorrow.

"It is towards the improvement of the conditions for a happy and a peaceful world that agencies like WHO are developing tremendous activities in various field.

"And it is recognized that WHO has the responsibility to guide and to assist Governments to learn and tackle their health problems, by making available knowledge and experience gained all over the world to its members."

"It is the pool of knowledge it has to offer to the combined attack against sickness, and to the efforts towards prevention of diseases and promotion of health rather than the material capacity of the organization which is the background of the organization's leading position today in the field of health."

The Chairman also wanted the conference to lay emphasis on school health education, "Let us," he said, "by our discussion of school health education in this region, help to make it clear to our economic and social planners that healthy people are a prerequisite for healthy economic development and that in our schools much can be done to ensure better health for all our peoples tomorrow."

Health Education in Schools

The South-East Asia Regional Committee of WHO devoted the third day of its session in Delhi on 26-9-56 to a consideration of problems relating to health education in schools. Expression of views by participants centred round this year's subject for technical discussion: "How can school health programmes be made more effective in South-East Asia."

In introducing the subject Lt. Col. T. C. Puri (India), who was in the chair, stressed the special importance of health education in S.E. Asia where ignorance, poverty and other socio-economic conditions were responsible for so much preventible disease and sickness.

In planning for health education of the public, he said, the school child should receive special priority for a variety of reasons. This group of the population was easily accessible and the agency to carry out the work was already there in the form of the school teacher. Through the school child the awareness and knowledge of health could be projected to the home and the neighbourhood and when the child grew up it could be expected to be an adult with the right attitude on matters of health.

Delegates from Afghanistan, Burma, Ceylon, India, Indonesia, Nepal, Portugal and Thailand reviewed the present status of health education in their countries and their future plans. Representatives of the Rockefeller and Ford Foundations and several other observers also took part in the discussion.

World Congress of Doctors for the Study of Present-Day Living Conditions

The second International Conference of the World Congress of Doctors for the Study of Present-Day Living Conditions will be held from September 27 to 29, 1957, in Cannes, France.

The following programme is for discussion: I. The Level of Nutrition and the Incidence of Disease, II. Effects of Work on Physical and Mental Health, III. Effects of Increased Ionizing Radiation on Human Health.

Further information may be obtained at the Secretariat of the World Congress of Doctors, Vienna, I, Wollzeile 29/3 (Austria).

World Genetics Symposium

The Indian Agricultural Research Institute, New Delhi, was invited by the Science Council of Japan to attend an international genetics symposium held in Japan on 6-12 September, 1956. Dr. B. P. Pal, director of the institute attended the symposium on behalf of the Government of India. The symposium, which is the first of its kind held in an Asian country, was a joint venture organised by the Science Council of Japan in collaboration with the universities of Tokyo and Kyoto (Japan) and the National Institute of Genetics and Breeding. Among the problems which came up for discussion at the symposium were that of applied genetics, induced mutation, polygenic inheritance and micro-organism and viruses.

CORRESPONDENCE

The Editor is not responsible for the views expressed by correspondents

Clinical Experiences with a New Drug on Lepra Reaction

SIR,—After going through the article on the "Clinical Experiences with Phenyl-Methyl amine P-aminobenzene Sulphonate on Lepra Reaction" (*J. Indian M. A.*, **26**: 314, 1956) I could not help feeling that the experience of the author with leprosy is rather limited and outmoded. He still speaks of neural leprosy as a separate entity. Every leprologist agrees that the term neural is erroneous as nerve involvement is a constant feature of all types of leprosy and the difference lies only in the degree of involvement in a particular variety. Then he says that an "A.H., 30 M.M., an old tuberculoid case, with anaesthetic area on the right thigh of 4" diameter, showed lepra reaction". Lepra reaction cannot occur in a tuberculoid case. It will occur only in lepromatous leprosy. According to him "scrapings for leprosy bacilli were negative before starting the treatment", which can never occur if it were really a case of lepra reaction that he was treating. To my mind, it appears that the author was treating a tuberculoid case in reaction. In that case recovery could have occurred even without any injection. I am not saying that the drug he used is useless. But on my part I will believe the efficacy of the drug only after a thorough study of the same by a leprologist of repute under suitable laboratory conditions. I am etc.

Gandhi Memorial Leprosy Foundation, Kerala Control Unit, S. L. Puram P.O.

T. N. N. BHATTATHIRIPAD, M.B.B.S.

REVIEWS

Clinical Urology for General Practice—By Justin J. Cordonnier, M.D., F.A.C.S. The C. V. Mosby Company, St. Louis, U.S.A., 1956. Board-bound in grained cloth; 252 pages, 10×7 inches, with 47 illustrations. Price $6·75.

The subejct of urology has gradually become a specialised one, often requiring a high degree of wisdom and technical skill in the diagnosis and treatment of some conditions. Nevertheless, the medical student, who nowadays has to learn many subjects in a short period of time, has to know about the common urologic diseases, as also their diagnosis and treatment. This book contains materials suitable mainly for the teaching of urology to senior medical students. There are obvious limitations to urological conditions being diagnosed and treated as encountered in general practice. But a perusal of this book would certainly enable the practitioner to meet satisfactorily the usual and common situations in urology. The uncommon and rare conditions, as also extensive academic discussions, have naturally been left out, as coming obviously within the domain of the urological specialist. Paper, type, printing, illustrations and binding are good, all conducive to easy and effortless reading.

A Synopsis of Contemporary Psychiatry—By George A. Ulett and D. W. Goodrich. 243 pages including index. The C. V. Mosby Company, St. Louis, U.S.A., 1956. Price not mentioned.

This handbok of psychiatry is meant for the guidance of young psychiatrists in their daily practice. The medical student, the nurse and the general medical practitioner will also find it useful in tackling and treating a mental patient. Throughout the book more stress has been laid on the practical points on diagnosis and treatment than on theoretical discussions. In the first few pages the authors have briefly mentioned the names and the contributions of the pioneer workers in the field of psychiatry. The chapters on history taking and diagnostic procedures are informative as well as illuminating. The psychiatric students in their daily routine work will derive great benefit from the psychological tests given here. The classification of the clinical syndromes is somewhat confusing and bewildering to the beginner. The subtle differences in the symptomatology of various mental disorders are difficult to discern even by those who are veterans in this field. The chapter on mental deficiency is too brief to serve any useful purpose. The chapters on therapeutic measures are elaborate and such specific therapies as electroshock, insulin treatment, drug and hydrotherapies have been adequately dealt with. The chapters on forensic psychiatry and mental health, i.e., mental hygiene are precise and concise. Reference books have been listed at the end of each chapter.

Bulletin of the Ophthalmological Society of Egypt. Vol. XLVIII—Session 52, 1955. Pages 419.

The Ophthalmological Society of Egypt deserves congratulation for this splendid volume. This covers practically all fields of clinical and surgical ophthalmology. Annexe 7 gives the report of the Committee on the teaching of ophthalmology of the International Council of Ophthalmology—June 1954. This volume will be of interest to all ophthalmic surgeons and all teachers of ophthalmology. Of general interest is the article "The evolution, development and realisation of national anti-ophthalmia and anti-trachoma campaign". Some of the observations will be useful for anti-trachoma campaign in India. In Egypt, it has been demonstrated that the discharge of purulent ophthalmia is the vehicle of trachoma virus. So if ophthalmia is fully cured in children, incidence of trachoma will diminish. Koch-Week's infection, in untreated cases, may remain for weeks and months without any symptoms or exciting only slight subacute or chronic discharge. These cases are the carriers. In Egypt, the common housefly may be a major factor in the epidemic of ophthalmia. In anti-ophthalmia campaign in children up to 6 years of age, 0·5 g. of sulphonamide per 10 kg. of body weight given once daily on three successive days has been found effective. So prevention of trachoma should begin by effective cure of ophthalmia in children.

Urological Surgery—By Austin Ingram Dodson, M.D., F.A.C.S. (with contributions by nine others). Third edition, 1956. The C. V. Mosby Company; St. Louis, U.S.A. Board bound in cloth, 10×7 inches, 868 pages with 664 illustrations.

The subject of urological surgery has nowadays become quite an important one; and with the safety assured to modern surgical practice by better anaesthesia, resuscitative measures and careful pre- and post-operative supervision, more and more improvements and modifications are being steadily brought to bear upon this comparatively newer subject of urological surgery. Under these circumstances, it has perhaps been wise that in this very useful book, "no effort is made to include all worth-while surgical procedures", but to include "one or more procedures dealing with each surgical problem." This has naturally been necessary to limit the volume to a reasonable size. It further helps the reader to keep his mind and ideas clear, without being burdened with many methods or procedures to meet a particular situation. In this edition new additions have naturally been made, including a separate chapter on Postoperative Urinary Incontinence. This has necessitated the elimination of a few chapters not very directly concerned with urological surgery and about which (e.g. Acid-Base Balance and Fluid Administration) excellent monographs are now available.

This new edition, appearing six years after the previous one should be welcomed by young surgeons doing urological surgery and also by other general surgeons who often have to undertake this type of work. The style is direct and clear, which makes the book interesting to read. It has a large number of illustrations distributed throughout the text.

SUPPLEMENT
Journal of the Indian Medical Association

VOL. 27, No. 8 CALCUTTA OCTOBER 16, 1956

III ANNUAL CONFERENCE OF BOMBAY TERRITORIAL BRANCH, IMA, 1956

The Third Annual Conference of the Bombay Territorial Branch was held on 31st March and 1st April 1956. Dr. Mangaldas J. Shah was the Chairman of the Conference Sub-Committee and Dr. R. K. Menda and Dr. M. A. Panwala were the Organizing Secretaries of the Committee. Dr. R. V. Sathe presided over the Conference.

Dr. Sathe in his presidential speech said the following :

"For some time past, the I.M.A. has represented to the Government the necessity to improve the water supply of the towns and especially the villages with a view to improve their sanitation and provide supply of drinking water. The first five year plan has made some progress in this direction. And it is expected provision would be made in the second five year plan to achieve further considerable progress. Bombay has been fortunate with regard to its water supply. And the Government and the Municipal Corporation have to be congratulated for their achievement of increased water suply to the City by their Vaitarna scheme. The first phase of this has been completed in October 1954 and this has increased the daily average supply of water to this city by about 13 million gallons over the previous years. This does not, however, ensure adequate supply to all areas in the town. Proper distribution to various areas of the town is yet to come.

The medical profession and the public of the town have just passed through a scare created by the contamination of our city's water supply by a dead body found in a water supply duct. The grim story of viral contamination in the water supply of Delhi and the subsequent epidemic of jaundice which attained considerable magnitude in that city have still been fresh in our minds. Its import in Bombay was also anticipated. At such a juncture, this story of contamination of our water supply caused concern in the public mind. Thanks to Providence, the mischief was detected early, preventive measures like hyper-chlorination of water supply were instituted and the public was promptly warned to boil the water before consumption. Analysis of the water also showed very little chemical or bacterial contamination. And the threat of the epidemic over the city has been over. The Government and the Municipal Corporation have once again to be congratulated for their speedy measures. And let us hope, all possible precautions will be taken to prevent repetition of such a dangerous incident in the future.

The other important event which has also caused a scare, if I may be permitted to say so, amongst the medical profession of this State is the recent statement made by our Honourable Minister of Health on the floor of the Assembly, referring to the possibility of importing doctors from the West Bengal State to man the medical services in the rural areas of this State. This has been due to his anxiety to fill in a large number of vacancies in the B.M.S. Class II and III cadres. Had it not been for the language problem which would make these doctors from other States unsuitable to manage work in rural areas of this State, the Government would have imported these doctors. While the eagerness of the Minister of Health to keep the B.M.S. Cadres fully manned and functioning efficiently could be appreciated, I feel the right way to solve the problem is to remove the factors which have led to these vacancies in the services. The "GO TO THE VILLAGES" slogan has been dinned into our ears times without number but the difficulties in this going to the village which have been repeatedly pointed out have not been

DR. R. V. SATHE, THE PRESIDENT OF THE CONFERENCE.

taken notice of. These villages have no proper approach roads. They do not offer proper residential facilities to the Doctors, they do not provide any facilities for the education of their children, nor do they provide facilities for the doctors to keep their medical knowledge up to date. And the doctors who are sent to these villages are paid meagre salaries and they have no chance to improve their finance by way of practice. The medical profession has repeatedly pointed out these difficulties. It is these that need to be attended to. Merely importing doctors from other states will not solve the problem and in any case that would not be the correct solution.

The E.S.I. Scheme was implemented in Bombay in October 1954 after prolonged negotiations between the Government and the Consultative Committee consisting of members of the I.M.A. and other Medical Associations of the city. A number of difficulties arose as the scheme started functioning. The Honourable Minister of Health with his team of administrators did his level best to meet with these in a very sympathetic manner, so that most of the difficulties have been solved or would find solution soon hereafter. Recently the list of special medicines has been enlarged and the Insured Medical Practitioner has now adequate supplies of these at his call for the treatment of the insured worker.

The scheme serves to provide medical care and other benefits to over five lacs of individual workers under what is called the Panel System with part time services of selected medical men who are already in private practice. At present nearly 1,000 panel doctors are enrolled in Bombay area.

With the experience of the last 18 months, one can say without fear of contradiction that this panel system in the scheme has stood its ground well. A Sub-committee of the Corporation visited Bombay to study the working of the scheme and examine its various aspects at first hand. In its carefully brought out report it has expressed its satisfaction with the work of our Insurance Medical Practitioners except in a few minor matters. The role of the Insurance Medical Practitioner in the scheme is a very vital one, and the success or the failure of the scheme hinges on his readiness to shoulder his burden fully and render efficient service to the insured worker. I heartily congratulate the Insurance Medical Practitioners in our area who by acquitting themselves so well have done honour to the profession.

I would now request the attention of the Government to the following :—

(*i*) When the scheme was introduced, the Indian Medical Association agreed to a capitation fee of Rs. 6/8/- per capita on the understanding that the position would be reviewed at the end of two years in the light of sickness incidence. That would be by the end of September 1956. I am sure the Government will collect the necessary data by then and implement necessary changes.

(*ii*) I also feel that the capitation fees to the doctors in Thana, Kalyan and other areas of the scheme should be uniform with those of doctors in Bombay. These doctors have considerable difficulties in their practice and have to spend extra amounts on their conveyances.

(*iii*) The Government also contemplate extension of the scheme to the families of the workers. In this extended scheme it appears, the family members of the worker will be granted only dispensary treatment and domiciliary maternity care. This is likely to cause a great deal of dissatisfaction amongst the workers. I appeal that the Government should call a round table conference of all the parties concerned, the employer, the employee, the corporation, the Government and the medical profession; these should consider various aspects of this problem and should evolve a more satisfactory form of medical care for the members of the family of the insured worker.

The scheme is a gigantic experiment in socialisation of medicine and it should be our earnest hope that it should succeed in abundant measure.

A certain number of beds have been set apart in some of the hospitals of the city for the workers in the E.S.I. scheme. These have been found insufficient and the E.S.I. Corporation are going to build a new hospital for the purpose with accommodation for 500 beds. While this will serve the needs of the workers of the scheme the number of beds available for the general public remains very inadequate. Still more deplorable is the nature of facilities offered to these patients in respect of accommodation, beds, linen, food, drugs, nursing and facilities for investigation and treatment. The conditions in these respects in some of the hospitals are appaling. And I appeal that the authorities concerned should see to it that a minimum of basic requirements should be available to every indoor patient.

Such basic requirements at these hospitals have also great significance from another point of view. Many of these hospitals are affiliated to the medical colleges of this city; and they provide training ground to the students in their clinical studies. The future generations of doctors are to be moulded in these hospitals. A certain standard of basic requirements noted above have therefore to be maintained as a necessity.

The Medical colleges to which these hospitals are affiliated are expanding very rapidly. The number of students admitted to these places has steadily grown. The courses taught here are very much expanded. And new ways of teaching are coming into vogue. A great need is felt for increasing the number of teachers so as to favourably influence the student-teacher ratio. While the honorary system of the various hospitals has proved its worth, it is felt that too much strain cannot be put on its personnel. And it is felt necessary to supplement them with additional full time teachers in clinical subjects also. Recently, the Indian Medical Council has introduced a scheme for compulsory post-examination internship of 6 to 12 months. The Indian Medical Association is always watchful of these developments.

The Indian Medical Association also aimed at the abolition of the caste system in the profession and has felt the necessity of a single qualification for all. The attitude of the Government in favouring the indigenous systems of medicine runs counter to this aim. Thus Government has started several Ayurvedic colleges, which will create a new cadre of Practitioners. What the Indian Medical Association gained by the abolition of the L.C.P.S. qualification is now being countered by the attitude of the Government. As our Prime Minister has remarked there should be only one system of medicine viz. the scientific system. And it is high time Government directed its powers to apply this orientation to the study of Ayurveda. I am of opinion that pure Ayurveda should no more be taught. I am also against mixing of teaching of eastern and western systems of medicine to undergraduate students as is done at present in Ayurvedic colleges. I feel that Ayurveda should be taught only at the post-graduate level. A fully trained medical graduate would be the best equipped to the study of Ayurveda with this new orientation. In this way the best in Ayurveda will be preserved and the old and out-dated will disappear.

I would now refer to the menace of spurious drugs. The number of such drugs has grown in the last few years. And the magnitude of the mischief has included life-saving drugs like chloromycetin and quinine. For selfish ends these makers of spurious drugs commit "murders" of the helpless patients. And when on few occasions they are caught they escape with small fines and imprisonments because of legal limitations in punishment. The Government is trying its best to meet with this menace. It has appointed a committee the Spurious Drugs Committee—to suggest ways and means to combat this trade in spurious drugs. The office and staff of the Drug Controller have also been doing what they can. But I feel it is necessary that the law in this respect should be so amended as to make deterrent punishment possible to those who are found guilty of manufacture or sale of such spurious drugs.

For some time past there was an unfortunate controversy in the country regarding the utility and safety of B.C.G. Vaccination as a preventime measure. There was opposition voiced from distinguished sources. And one was reminded of the "conscientious objectors" against such a measure as vaccination against small-pox decades ago. The Indian Medical Association has always been in favour of all prophylactic measures which are safe and useful; so it has been with B.C.G. The scheme is working very satisfactorily in this State.

Bombay is also proud of its milk supply scheme which functions on a gigantic scale, offering good quality milk to the whole of the city. The scheme has won reputation of being the best in Asia. And the authorities deserve our praise for the same. Today we are assured of a supply of pure milk at reasonable price. The poorer section of the population also get a cheaper but equally nutritive substitute in the formed of toned milk. It appears the Government contemplates further measures in the augmentation of the scheme. With such augmentation and with proper economies in the management, they should be able to offer this valuable nutritive article to the public at still lower prices.

The Association has been very fortunate in having enthusiastic office bearers. In the last few years the Association has arranged regular clinical meetings, lectures, lecture demonstrations and exhibition of medical films. These have been very popular and are well attended. There has been similar great activity in this field by other medical organisations in the city. Sometimes there have been over-lappings in the timings of these programmes. And at times there was wasteful repetition. I have hopes, in the near future, we shall be able to produce a coordinated programme of clinical meetings on behalf of all these bodies at which these defects will be minimised, and medical profession of the town will always be afforded opportunities to keep themselves abreast of the times.

During the last year, we were also fortunate to have amongst us several foreign doctors, well known in their specialities. It was a pleasure to meet and hear them. Our office bearers have taken great pains at such times to arrange their meetings.

On this occasion, I cannot pass without a mention to an activity of the Central I.M.A.—the publication of its monthly journal "Your Health". This has aimed at educating the lay public in matters of health. The journal is very interesting and though it is meant for the lay public, it makes interesting and informative reading even to a well informed doctor. The authorities of the Central I.M.A. have to be congratulated for this feature of their activity. An edition of the journal in Hindi already appears. We have negotiated with the State Government regarding the possibility of having editions of the journal in Marathi and Gujarathi. We have not succeeded so far. However, I feel, the State Government could profitably spare some finance towards circulation of this journal to the lay public, as a part of their programme for Public Health Propaganda."

BRANCH NOTES

ALWAR BRANCH—A meeting of the branch was held on 1-9-56. Dr. B. M. Kothari presided. Eighteen members were present. Office bearers were elected with Dr. C. M. Sharma and Dr. J. N. Mathur as president and secretary respectively. The Government was requested to start condensed courses at Jaipur and abolish compartmentalism in medical service in Rajasthan. Dr. P. N. Mathur gave a talk on "The Observation of Appendicitis."

BARIPADA BRANCH—The members of the branch held a tea party to give a hearty send off to Dr. B. K. Das who was leaving for U.S.A. and Canada for postgraduate training under the auspices of the I.M.A.

BELLARY BRANCH—A clinical meeting of the branch was held on 25-8-56. Dr. Manoli of St. Mary's Hospital spoke on "Surgical Emergencies."

BHIR BRANCH—An extraordinary meeting of the branch was held on 7-8-56. Thirteen members were present. Dr. L. D. Khatri, Director, Medical and Public Health, Hyderabad State spoke on Medical and Health Services in U.S.S.R.

BIKANER BRANCH—The annual function of the branch was held on 18-8-56. Dr. J. Prasad presided. Office bearers were elected with Dr. J. Prasad as president and Dr. J. N. Razdan as secretary.

CHIKMAGALUR BRANCH—A meeting of the branch was held on 4-8-56 with Dr. S. V. Rama Rao, District Health Officer in the chair. Dr. M. J. Rajanna was elected president and treasurer of the branch in place of Dr. M. Puttaiya, on transfer. Dr. S. T. Puttanna of K. K. Hospital, Mysore spoke on "Common Eye Diseases in General Practice."

CHITALDRUG BRANCH—The annual general body meeting of the branch was held on 25-8-56. Office bearers were elected with Dr. D. Shamanna as president and M. Appajappa and Dr. B. K. Nagaraj as secretaries. Dr. David gave a talk on Suppurative Offitis media. Dr. Devendra presented a case report on "Ulnar Nerve Palsy". Dr. D. Shamanna, a case report on Sulphonilamide Poisoning and Dr. Appajappa demonstrated radiograms.

COIMBATORE BRANCH—A meeting of the branch was held on 2-7-56. Dr. T. V. Sivanandam presided. Seventy members were present. Dr. V. Srinivasan of Government Erskine Hospital gave a talk on Treatment of Congestive Failure.

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A meeting of the branch was held on 21-7-56 with Dr. Sivanandam in the chair. Sixty members were present. Dr. C. A. Naidu of Government Erskine Hospital, Madurai gave a talk on "Coccal and Virus Diseases of the Skin."

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A clinical meeting of the branch was held on 25 August 1956. Dr. T. V. Sivanandan presided. Seventy-eight members were present. The members condoled the death of Dr. P. Rama Rao, the well known radiologist of Madras. Lt. Col. Dr. A. N. Subbaraman, the district medical officer gave a talk on "Appendicitis".

DALTONGANJ BRANCH—A meeting of the branch was held on 2-7-56. Sixteen members were present. Dr. R. Sinha, Civil Surgeon, Palamau, spoke on Primary Glaucoma.

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A meeting of the branch was held on 19-8-56. Dr. Anirudh Prosad spoke on Acute Abdomen. It was felt that this branch was not in a position to invite the 17th Provincial Conference in 1957.

DEORIA BRANCH—A general meeting of the branch was held on 12-8-56. Dr. (Mrs.) S. Mohindra presided. Twelve members were present. Routine business was gone through. The members objected to the practice of circulating election propaganda material to the members or branches through the State Office.

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The annual meeting of the branch was held on 9-9-56. Dr. S. N. Mukherjee read the address of the outgoing president. The annual report and the audited accounts were presented. Office-bearers were elected with Dr. A. Ahmad as president, Dr. N. C. Jain as secretary and Dr. (Miss) Bimla Kumari as joint secretary.

FAIZABAD BRANCH—A special meeting of the branch was held on 13-8-56 to meet Dr. K. M. Lall, Director, Medical and Health Services, U.P. Dr. S. S. Misra presided. Thirty-one members were present. Dr. V. D. Kapur welcomed the guest and drew his attention to some of the grievances e.g. sales tax, Excise Regulations, insufficient beds in hospitals, lack of arrangements for treatment of T.B. patients and isolation wards etc. The Director promised to do his best in these matters and gave a short review of the 2nd Five Year Plan Health Programme. A dinner was held later.

FORBESGANJ BRANCH—The annual general meeting of the branch was held on 9-9-56 and office bearers were elected with Dr. A. Niranjan as president, Dr. B.

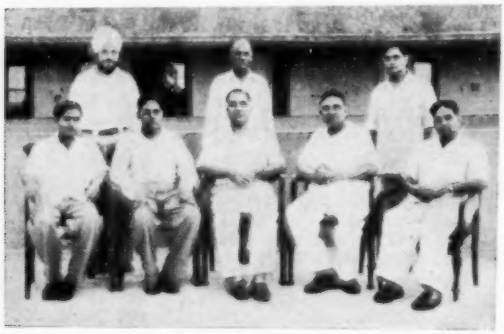
K. Sarkar as hony. secretary and Dr. (Mrs.) R. Tagore as asst. secretary.

GORAKHPUR BRANCH—A meeting of the branch was held on 31-7-56. Dr. Mrs. Thappa presided. Thirty-eight members were present. The following cases were shown and discussed: (1) Choleycysdits, (2) Thromboangiitis Obliterans, (3) 2 cases of Osteomyelitis having Tubercular and Syphilitic origin by Dr. S. S. Sharma, (4) Muscular Atrophy by Dr. B. P. Dubey, (5) Pain in the Chest due to neuralgia which later on caused numbness of the whole of the extremities of that side by Dr. A. S. Bhalla.

HOOGHLY, CHINSURAH, CHANDERNAGORE BRANCH—A meeting of the executive committee of the branch was held on 11-8-56. Nine members were present. Dr. M. M. Mukherjee presided. The secretary of the Indian Red Cross Society, Hooghly District and of the King George V Silver Jubilee Maternity Home and Child Welfare Centre were requested to send copies of their constitution, function and duties. The West Bengal Government and the Civil Surgeon of Hooghly were requested to accommodate representative of the branch in the Sub-Divisional Hospital Committee. The Sadar Tuberculosis Association was requested to substitute the word "The president" by a "representative" of the branch in the committee.

JAHANABAD BRANCH—The annual general meeting of the branch was held on 9-9-56 with Dr. S. S. Lal in the chair. The annual report and the accounts for 1955-56 were adopted. The report shows that 7 meetings were held during the year. The branch rendered help to the Blind Relief Camp of Ghosi. Health Week and Pure Water Day were observed. Five new members were recruited. Office bearers for 1956-57 were elected with Dr. S. S. Lal as president and Dr. S. Nigam as secretary.

JAMMU BRANCH—The first meeting of the newly started Jammu branch was held on 30-7-56. Dr. S. S. Fotedar was elected the president of the branch.



THE PRESIDENT WITH THE MEMBERS OF THE JAMMU BRANCH, I.M.A.

KALYANI BRANCH—A meeting of the branch was held on 9-8-56 to record its sense of grief at the sudden demise of Dr. H. C. Mukherjee, Governor of West Bengal.

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A general meeting of the branch was held on 9-8-56 with Dr. B. Mukherjee in the chair. Dr. Munshi, president and Dr. Samar Roy Chaudhury, Hony. Joint Secretary, Bengal Provincial Branch, I.M.A. attended the meeting on special invitation. The members protested against the Indian Medical Council Bill 1956 and a copy of the resolution was forwarded to the Union Health Minister.

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A meeting of the branch was held on 3-9-56. Dr. B. Mukherjee presided. Dr. K. K. Adhikary send a paper on "Role of Marriage and Pregnancy in Tuberculosis". Members took part in the discussion that followed.

KANPUR BRANCH—Independence Day was celebrated by the members of the branch at the Temple of Service on 15 August 1956. An interesting programme was arranged.

The members of the branch in a meeting held on 24-7-56 condoled the death of Dr. Fakiray Ram, an old member of the branch. Dr. R. Prasad presided.

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A meeting of the branch was held on 24-8-56 with Dr. R. Prasad in the chair. Dr. S. N. Mathur, Principal, Medical College, Kanpur, demonstrated the following cases: (1) Paralysis of Muscles of Mastication; (3) Cancer Gall Bladder; (3) Carcinoma of the Lower part of the Rectum; (4) Osteoma-Mandiblec Condyle. Dr. M. A. Khan demonstrated a case of right forearm tumour. Dr. R. L. Agarwal showed a case of Periosteal Sarcoma.

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A clinical meeting of the branch was held on 9-9-56 with Dr. R. Prosad in the chair. Dr. Pritam Das of Lucknow Medical College delivered a lecture on Surgery in connection with the Cardiac Lesion with special reference to Mitral Stenosis.

KARIMNAGAR BRANCH—A meeting of the branch was held on 23-6-56 with Dr. S. M. H. Juffari in the chair. Dr. Lane of Dichipally Leprosy Sanatorium demonstrated cases.

KARNAL BRANCH—A general meeting of the branch was held on 9-9-56. The annual report of the branch for 1955-56 was adopted. Office bearers were elected with Col. H. A. Bali as president and Dr. Lok Nath as secretary. The annual report of the branch shows an increase in membership. Eight meetings were held during the year. Three special meetings were also held. Various clinical subjects were discussed in some of the meetings.

KATWA BRANCH—A Rural Medical Practitioners Conference was held under the auspices of the Indian Medical Association, Bengal Provincial Branch, at Surya Narayan Memorial Hall, Katwa, on 2nd and 3rd June 1956.

The conference was organised by the Katwa Branch of I.M.A. in collaboration with the Kandra Branch under the same Subdivision. Many rural medical practitioners attended the conference in spite of the foul weather. The proceedings of the conference was spread over in three different sessions i.e. Socio-Medical (open to the public), a General Session and a Scientific Session.

The Proceedings of the conference began with the inaugural address of Lt. General D. N. Chakraborty, the Director of Health Services, Government of West Bengal, and the session was presided over by Dr. K. K. Sen Gupta, the Ex-president, Bengal Provincial Branch. General Chakraborty placed before the public and the medical profession the different aspects of the health plan of the State and its financial implications. He also made it clear that the position made in the plan would not meet the health needs of the people and it falls short in utilising the services of all the qualified medical men, available for the greater interest of the people, because of lack of financial resources.

The organising secretary of the conference placed the view points of the Association regarding relations of the general people to the medical profession and the Government and criticised the attitude of the Government health policy and asked for active co-operation between the people, Government and the Medical profession to make the health plan a success. Dr. J. Mazumder, Hony. Provincial Secretary, I.M.A., Bengal made a strong plea for co-operation and understanding

between the state and the people including the medical profession in drawing up and executing the relevant plan and he believed that without an active and willing participation of the people no national plan could be properly and effectively implemented. Dr. D. P. Mukherjee, Chairman, Reception Committee, in his note of welcome dealt with the historical and cultural background of Katwa and the very many problems faced by the people and the profession of the rural areas, relating to medical and health care.

Amongst the other speakers in the Socio-Medical session were Sri Anadinath Mukherjee, an eminent social worker and some members of the medical profession, who spoke on different topical health subjects.

Dr. K. K. Sen Gupta in his presidential address referred to the cult of Vaisnavism once born at Katwa and also dealt with the I.M.A.'s opinions on the Socio-Medical aspects and problems of the country and expressed gratification on the newer approach made in this conference to have the clear understanding between the Government, I.M.A. and people to pull common resources to meet the health needs of the country.

In the General Session Dr. N. K. Munshi the president of I.M.A., Bengal Provincial Branch, presided, Dr. R. C. Adhikary inaugurated it with a speech on Tuberculosis, a social menace. Several other speakers spoke on the condition of the doctors of the locality in the present time.

In the Scientific session Dr. N. K. Munshi lectured on Health Services of the Government of China from his own experience during his visit there and the following doctors spoke on the subjects mentioned against their names.

(a) Dr. A. B. Mukherjee—Eclampsia and its Management. (b) Dr. S. Sen—Fracture and its Emergency Treatment. (c) Dr. S. Konar—Peripheral and General Circulatory Failure. (d) Dr. H. S. Chakrabarti—Oedema, Causes and Treatment. (e) Dr. S. K. Banerjee—Childrens Diarrhoea. (f) Dr. S. Chatterjee—Short Case note on Pyaemic Abscess in a child 3 months old.

KHAMGAON BRANCH—A meeting of the branch was held on 5-8-56. Dr. Budhay showed one suspected case of "Addison's Disease". Some of the members took part in the discussion.

KOTAH BRANCH -The annual celebration of the branch was held on 22-4-56 with Dr. P. L. Rishi in the chair. Dr. B. L. Rawat, Commissioner Kotah Division inaugurated the function. Dr. N. C. Chordia accorded welcome to all. In the scientific session, articles on Anti Malarial Drugs, Chronic Ulcer, Dental Cares, Management of Head Injury, Cirrhosis of Liver and Pleural Effusion were read. A clinical demonstration of cases in the wards was held. Dr. C. V. Vasavada spoke on behalf of Red Cross Society.

LUCKNOW BRANCH—The executive committee of the branch has decided to celebrate the silver jubilee of the branch in the 1st or 2nd week of December 1956. A programme has been also formulated.

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The branch has decided to award on the occasion of the Silver Jubilee Celebration of the branch 2 cash prizes of Rs. 200/- and Rs. 100/- only to two best articles on any subject on clinical, non-clinical or experimental work. The competition is open to medical graduates only and to members of I.M.A. of U.P. State.

MADRAS CITY BRANCH—A meeting of the Madras City branch was held on 30-8-56. The members condoled the death of Late Dr. P. Rama Rao, radiologist, Madras. In moving the resolution, Dr. D. V. Venkappa gave a brief sketch of his life and career.

MADRAS STATE BRANCH—A meeting of the Council of Madras State Branch was held on 27-5-56. Dr. Y. P. Vasudevan presided. Thirty-two members were present. A resolution was passed condoling the death of Dr. (Miss) E. L. Rebeiro, Madras; Dr. J. A. S. Masilarnani, Madras; Dr. K. Venkata Rao, Madras; Dr. R. Hermon, Culcut; Dr. B. Gnanasundram, Sholavandan and Dr. C. J. Siva Rao, Madras and Dr. R. E. S. Muthaya, Madras. The Council approved of the personnel of the sub-committee which the State Council decided to form regarding entrusting curative medicine to the Health Assistants as per II Five Year Plan. The statement of accounts for February-April 1956 was adopted. The budget balance as on 1-5-56 was adopted. The attention of the branch secretaries was drawn to the rule relating to C.F.C. and the submission of the membership lists at the beginning of each half year. The Council appreciated the exhaustive note prepared by Dr. U. Krishna Rao regarding working conditions of Asst. Medical Officers in Tea Gardens and desired the implementation of the suggested status for them. The Council felt that unless legislation in deterrant terms similar to the laws in U.K. and U.S.A. is enacted, the growing menace of quackery cannot be arrested. The Council wanted to inform the Managing Editor, Madras Clinical Journal not to write any more editorials in the Journal according to the directive of the Central Council. The Council resolved to recommend to the government that the services of registered medical practitioners with necessary post graduate qualifications in surgery or surgical experience of 5 years may undertake the operation of vasectomy at Rs. 10/- only in their Nursing Homes or Clinics. The Council also wanted to circulate the questionnaire on Vasectomy and gather the opinion of the public. The members were requested to supply the articles required by the Women's Welfare Extension Project, Salem, as per her letter. The Honv. Secretary was requested to fix the date of 11th Madras State Medical Conference in consultation with the Reception Committee, in October 1956 or to a later date. The council decided to recommend a panel of 4 names for consideration of the collector of Madras in the formation of the Anti-spurious Drug Committee. It was decided to hold the next council meeting at Madura. The Council decided to request the government to work E.S.I.S. under the panel system in Madura and to accept the offer and co-operation of the I.M.A.

MADURA BRANCH-A meeting of the branch was held under the presidentship of Dr. G. A. Naidu at Cumbakarai, a very attractive place. Dr. V. Sreenivasan spoke on Treatment of Comas. Lt. Col. C. K. P. Menon outlined the Surgical aspect of Comas.

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A meeting of the branch was held on 18-8-56 with Major G. A. Naidu in the chair. Six new members were introduced in the meeting. Dr. K. C. Nambiar spoke on "Low Back Ache". Dr. P. K. Doraiswamy spoke on Experimental Production of Congenital Defects.

MALGONDA BRANCH—A meeting of the branch was held on 11-7-56. Dr. G. V. Pillay, Medical Officer, Suryapet presided. Dr. G. Ramulu demonstrated cases of Appendicular Abscess, Diabetis and Diabetis with carbuncle. Dr. M. G. Baig presented a case of fracture shaft of femur where P.O.P. was applied. Dr. Nagabhusanam spoke on Cholera.

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A meeting of the branch was held on 18-8-56 with Dr. A. K. Badruddin in the chair. Dr. A. F. Qureshi, the Medical Officer, Nagarjunsagar spoke on Protein Deficiency Oedema and different types of chronic ulcers. Dr. Nagabhusanam, Civil Surgeon, Nalgonda read a paper on "Investigation of a case of Gastro-entritis". Dr. G. Ramulu spoke on Hoemophysis of 19 cases admitted in the Civil Hospital. Dr. M. B. Baig discussed a case of Liver Abscess.

MANDAPETA BRANCH—A meeting of the branch was held on 24-7-56 Dr. B. Subba Rao presented a case of Pleuresy due to Tropical Eosinophilia.

MANDYA BRANCH—The annual general body meeting of the branch was held on 26-8-56. Dr. M. Krishnamoortyrao presided. Office bearers were elected with Dr. Mirle Puttaiya as president, Dr. B. Sethe Rao as hony. secretary and Dr. K. Ramachandrarao as joint secretary. It was decided to arrange the monthly meetings on the first Saturday of every month. Previous to this meeting, a lecture was arranged under the presidentship of Dr. Mirle Puttaiya. Sri Y. K. Raghunathrao of the Food Technological Institute of Mysore delivered a lecture on "Recent Advances in Food Technology and Commonsiuse".

A meeting of the branch was held on 22-7-56. Dr. D. C. Oza presided. Dr. H. M. Shah spoke on Medical Problems in a colliery.

MORVI BRANCH—A meeting of the members of the branch was held on 5-8-56. Dr. V. N. Mehta was in the chair. Dr. S. V. Baxi spoke on "Diagnosis and Treatment of Diabetic Mellitus".

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A meeting of the branch was held on 16-9-56. Dr. P. D. Raval spoke on Chronic Amoebiasis. Dr. D. C. Oza was in the chair.

MYSORE BRANCH—At an extraordinary general body meeting of the branch held on 19th May 1956, Dr. V. Subrahmanyan, Director, Central Food Technological Research Institute, Mysore, was enrolled as Hony. member of the branch.

PURNEA BRANCH—The annual general meeting of the branch was held on 12-9-56. Office bearers were elected with Dr. Miss S. Das as president, Major S. C. Mazumdar as hony. secretary and Dr. A. B. Sarkar as asst. secretary.

RAMANATHAPURAM BRANCH—A meeting of the branch was held on 1-7-56. Dr. V. Kuruvilla presided. Dr. N. G. Pandalai of Madura Medical College spoke on Recent Advances in Poliomyelitis.

SHAHJAHANPUR BRANCH—A meeting of the branch was held to condole the death of Dr. S. C. Sen, the president of the branch.

SHILLONG BRANCH—A meeting of the branch was held on 25 August 1956. Seventeen members were present. A case of Malignant Testes with Metastasis was presented by Dr. C. N. Hazarika. Revision of pension rules for government doctors was discussed.

SULTANPUR BRANCH—A meeting was held on 29-7-56 to condole the death of Dr. N. De, a founder member of the branch.

TIRUCHY BRANCH—A meeting of the branch was held on 14-8-56 with Dr. V. Enok in the chair. At the outset the members condoled the death of Dr. P. Rama Rau. Dr. P. K. Duraiswami of the All India Institute of Medical Sciences gave a talk on Experimental Production of Congenital Defects.

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A meeting of the branch was held on 18-8-56 with Dr. V. Enok in the chair. Dr. R. Subramanyam of Madras Medical College spoke on Diagnosis and Management of the Common Congenital Cardiac Disease.

TONK BRANCH—A meeting of the branch was held on 6-7-56. Dr. K. N. Punjal and Dr. J. C. Bhagi were elected president and hony. secretary respectively.

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A meeting of the branch was held on 20-7-56 with Dr. K. N. Punjal in the chair. Seven members attended the meeting. Dr. Punjal spoke on "ACTH and Cortisone".

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A meeting of the branch was held on 10-8-56 with Dr. K. N. Punjal in the chair. Eight members attended the meeting. Dr. I. S. Mathur spoke on "Constipation in infants". Dr. G. D. Narang gave a short review of the causes and treatment of Haemoptysis.

UKHRA BRANCH—The 1st meeting of the branch was held on 12-6-56. Dr. A. B. Sarkar presided. Twelve members were present. The meeting discussed the problem arising out of the fact that no benefit has been derived by colliery doctors who have been placed neither in category of officer nor workers. The meeting was of opinion that the above matter should be taken up at higher level.

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An extraordinary meeting of the branch was held on 12-8-56. Dr. A. Sarkar presided. Thirteen members were present. The meeting emphatically protected against the proposed I.M.C. Bill 1956 and urged upon the government to reconsider the bill in the light of the recommendations of the Indian Medical Association. The branch donated Rs. 20/- towards expenses of the deputation to New Delhi in this connection.

UTTAR PRADESH STATE BRANCH—A meeting of the working committee of the State Branch was held on 1-7-56. Seven members were present. Dr. Durga Prasad presided. Condolence resolutions were passed on the death of Dr. S. N. Mukherji (Banaras) and Dr. S. C. Sen (Shahjahanpur). Dr. M. M. S. Siddhu apprised the members of the correspondence done by the subcommittee with the Government on Excise Notification. Dr. Siddhu also gave an account of the deputation which met the Finance Minister on Sales Tax. It was decided to hold the conference on 27 and 28 October 1956, at Dehra Dun and a programme was outlined. It was decided to approach the government to take in a representative in the Life Insurance Corporation at Kanpur at Central and Zonal level. Regarding the suggestion of Central Office to observe health Week, it was decided to find out when U. P. Government celebrates the health week and to join with them in celebrations.

WEST KHANDESH BRANCH—A special meeting of the branch was held on 4-12-55 with Dr. L. M. Paithankur in the chair to discuss details of the 32nd All India Medical Conference to be held at Jaipur.

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A meeting of the branch was held on 26-2-56 with Dr. P. R. Ghogre in the chair. Business as per agenda was transacted.

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A meeting of the branch was held on 3-6-56 with Dr. L. M. Paithankar in the chair. The members gave a hearty send off to Dr. D. S. Shah who was proceeding to America for the residency post in general surgery.

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A special meeting was held on 27-6-56. Interesting films were shown.

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A meeting of the branch was held on 1-8-56. Members paid homage to the sacred memory of Lokamanya Bal Gangadhar Tilak.

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A special meeting was held on 26-8-56. Members promised their services for preventive measures within the municipalities of Dhulia in connection with Cholera epidemic.

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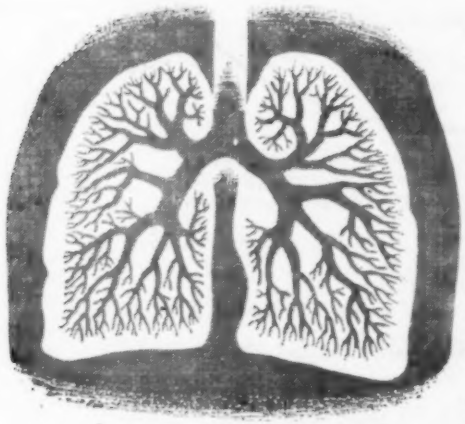

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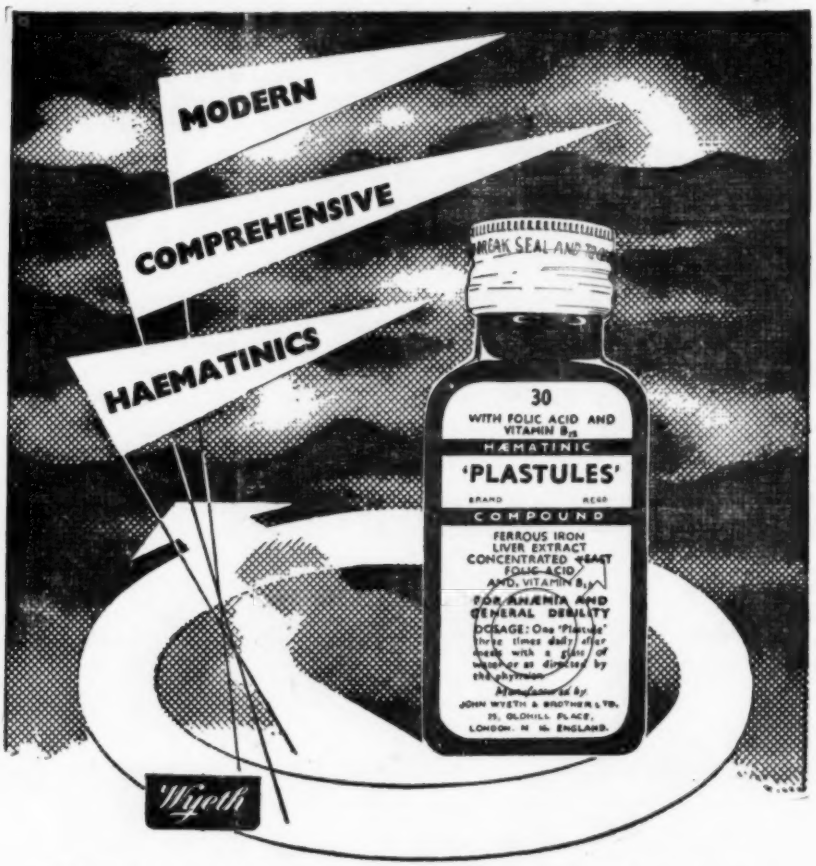

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